

**DIRECT TESTIMONY AND EXHIBITS OF**

**DAVID C. PARCELL**

**ON BEHALF OF**

**THE SOUTH CAROLINA OFFICE OF REGULATORY STAFF**

**DOCKET NO. 2018-82-S**

**IN RE: APPLICATION OF PALMETTO WASTEWATER RECLAMATION, LLC**

**FOR ADJUSTMENT OF RATES AND CHARGES**

**I. INTRODUCTION**

**Q. PLEASE STATE YOUR NAME, OCCUPATION, AND BUSINESS ADDRESS.**

**A.** My name is David C. Parcell. I am a Principal and Senior Economist of Technical Associates, Inc. My business address is Suite 130, 1503 Santa Rosa Rd., Richmond, Virginia 23229.

**Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL EXPERIENCE.**

**A.** I hold B.A. (1969) and M.A. (1970) degrees in economics from Virginia Polytechnic Institute and State University (Virginia Tech) and a M.B.A. (1985) from Virginia Commonwealth University. I have been a consulting economist with Technical Associates since 1970. I have provided cost of capital testimony in public utility ratemaking proceedings dating back to 1972. In this regard, I have previously filed testimony and/or testified in over 570 utility proceedings before about 50 regulatory agencies in the United States and Canada. Exhibit DCP-1 provides a more complete description of my education and relevant work experience.

**Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION?**

**A.** Yes. I have testified before this Commission a number of times, going back to 1980.

**Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?**

**A.** The South Carolina Office of Regulatory Staff (“ORS”) retained me to evaluate the cost of capital aspects of Palmetto Wastewater Reclamation, LLC (“PWR” or “Company”), relative to the current filing. I have performed independent studies and am making recommendations of the current cost of capital for PWR. In addition, since PWR is a subsidiary of Ni Pacolet Milliken Utilities, LLC (“Ni” or “Parent”), I have also evaluated this entity in my analyses.

**Q. HAVE YOU PREPARED AN EXHIBIT IN SUPPORT OF YOUR TESTIMONY?**

**A.** Yes, I have prepared one exhibit, labeled Exhibit DCP-2, identified as Schedule 1 through Schedule 13. This exhibit was prepared either by me or under my direction. The information contained in this exhibit is correct to the best of my knowledge and belief.

## **II. RECOMMENDATIONS AND SUMMARY**

**Q. WHAT ARE YOUR RECOMMENDATIONS IN THIS PROCEEDING?**

**A.** My overall cost of capital recommendations for PWR are shown on Schedule 1 and are summarized as follows:

Item	Percent	Cost	Weighted Cost
Debt	45.00%	5.04%	2.27%
Common Equity	55.00%	9.20%-10.00%	5.06-5.50%
<b>Total</b>	<b>100.0%</b>		<b>7.33-7.77%</b>

**Recommended cost of capital: 7.55% with 9.6% ROE**

PWR requests a cost of capital of 8.45 percent and a cost of equity of 10.75 percent.

**Q. PLEASE SUMMARIZE YOUR ANALYSES AND CONCLUSIONS.**

A. This proceeding is concerned with PWR's regulated wastewater utility operations in South Carolina. My analyses concern the Company's cost of capital. The first step in performing these analyses is to develop the appropriate capital structure. PWR proposes use of a capital structure with 40.28 percent debt and 59.72 percent common equity, which reflects the year ended August 31, 2018 ("Test Year") capital structure ratios of PWR.<sup>1</sup> I do not use this capital structure, since the recent capital structures of PWR have been constantly changing, as well as the fact that a significant portion of PWR's debt is represented by advances from affiliates. As a result, the Company's actual capital structure cannot be accurately described as a "market-driven" capital structure. Instead, I propose use of a hypothetical capital structure with 45 percent debt and 55 percent equity, which reflects the capital structure ratios of the proxy groups of water utilities I consider in reaching my cost of equity conclusion (*i.e.*, true "market-driven" capital structures).

The second step in a cost of capital calculation is to determine the embedded cost rate of debt. PWR witness Harold Walker, III proposes using a cost rate of 5.04 percent for debt, the rate as of August 31, 2018.<sup>2</sup> I use this cost rate in my analyses.

The third step in the cost of capital calculation is to estimate the cost of equity. I employ three recognized methodologies to estimate PWR's cost of equity, each of which I apply to three proxy groups of water utilities. These three methodologies and my findings are:

Methodology	Range
Discounted Cash Flow ("DCF")	8.1-9.2%
Capital Asset Pricing Model ("CAPM")	6.9-7.1%
Comparable Earnings ("CE")	9.0-10.0%

<sup>1</sup> Direct Testimony of Harold Walker, III, Exhibit HW-1, Schedule 1.

<sup>2</sup> *Id.*

1 Based upon these findings, I conclude that PWR's cost of equity is within a range of 9.20  
2 percent to 10.00 percent (9.60 percent mid-point), which is based upon the upper-end of  
3 my DCF results and upper-end of my CE results models.<sup>3</sup> I use the upper ends of my DCF  
4 and CE ranges in order to give some consideration to any perceived unique attributes of  
5 PWR.

6 Combining these three steps into the weighted cost of capital results in an overall  
7 cost of capital of 7.33 percent to 7.77 percent (which incorporates an 9.20 percent to 10.00  
8 percent cost of equity). My specific cost of capital recommendation is the mid-point of  
9 this range, or 7.55 percent (9.60 percent cost of equity).

### 10 III. ECONOMIC/LEGAL PRINCIPLES AND METHODOLOGIES

11 **Q. WHAT ARE THE PRIMARY ECONOMIC AND REGULATORY PRINCIPLES**  
12 **THAT ESTABLISH THE STANDARDS FOR DETERMINING A FAIR RATE OF**  
13 **RETURN FOR A REGULATED UTILITY?**

14 **A.** Public utility rates are normally established in a manner designed to allow the  
15 recovery of their costs, including capital costs. This is frequently referred to as "cost of  
16 service" ratemaking. Rates for regulated public utilities traditionally have been primarily  
17 established using the "rate base – rate of return" concept. Under this method, utilities are  
18 allowed to recover a level of operating expenses, taxes, and depreciation deemed  
19 reasonable for rate-setting purposes, and are granted an opportunity to earn a fair rate of  
20 return on the assets utilized (*i.e.*, rate base) in providing service to their customers.

21 The rate base is derived from the asset side of the utility's balance sheet as a dollar  
22 amount and the rate of return is developed from the liabilities/owners' equity side of the

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<sup>3</sup>As I indicate in a later section, my cost of equity recommendation does not directly incorporate the CAPM results, which I believe to be somewhat low at this time, relative to the DCF and CE results.

1 balance sheet as a percentage. Thus, the revenue impact of the cost of capital is derived by  
2 multiplying the rate base by the rate of return, including income and other taxes.

3 The rate of return is developed from the cost of capital which is estimated by  
4 weighting the capital structure components (*i.e.*, debt, and common equity) by their  
5 percentages in the capital structure and multiplying these values by their cost rates. This  
6 is also known as the weighted cost of capital.

7 Technically, “fair rate of return” is a regulatory and accounting concept that refers  
8 to an *ex post facto* (after the fact) earned return on an asset base while the cost of capital is  
9 an economic and financial concept which refers to *ex ante facto* (before the fact) expected,  
10 or required, return on a capital base. In regulatory proceedings, however, the two terms  
11 are often used interchangeably, and I have equated the two concepts in my testimony.

12 From an economic standpoint, a fair rate of return is normally interpreted to mean  
13 that an efficient and economically-managed utility will be able to maintain its financial  
14 integrity, attract capital, and establish comparable returns for similar risk investments.  
15 These concepts are derived from economic and financial theory and are generally  
16 implemented using financial models and economic concepts.

17 With regard to the regulatory standards, my testimony is based on my  
18 understanding that two United States Supreme Court decisions provide the controlling  
19 standards for a fair rate of return. The first decision is *Bluefield Water Works and*  
20 *Improvement Co. v. Public Serv. Comm’n of West Virginia*, 262 U.S. 679 (1923). In this  
21 decision, the Court stated:

22 The annual rate that will constitute just compensation depends upon many  
23 circumstances and must be determined by the exercise of fair and  
24 enlightened judgment, having regard to all relevant facts. A public utility  
25 is entitled to such rates as will permit it to earn a return on the value of the

property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties; but it has no constitutional right to profits such as are realized or anticipated in highly profitable enterprises or speculative ventures. The return should be reasonably sufficient to assure confidence in the financial soundness of the utility, and should be adequate, under efficient and economical management, to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties. A rate of return may be reasonable at one time, and become too high or too low by changes affecting opportunities for investment, the money market, and business conditions generally.

It is generally understood that the *Bluefield* decision established the following standards for a fair rate of return: comparable earnings, financial integrity, and capital attraction. It also noted that required returns change over time, and there is an underlying assumption that the utility be operated efficiently.

The second decision is *Federal Power Comm'n v. Hope Natural Gas Co.*, 320 U.S. 591 (1942). In that decision, the Court stated:

The rate-making process under the [Natural Gas] Act, *i.e.*, the fixing of 'just and reasonable' rates, involves a balancing of the investor and consumer interests. . . . From the investor or company point of view it is important that there be enough revenue not only for operating expenses but also for the capital costs of the business. These include service on the debt and dividends on the stock. By this standard the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital.

The Commission has looked to the *Hope* and *Bluefield* standards as guidance for setting rates. For example, in both Docket No. 2013-59-E, a Duke Energy Carolinas rate case from 2013, and in Docket No. 2016-227-E, a Duke Energy Progress, LLC rate case from 2016, the Commission stated:

In setting rates, the Commission must determine a fair rate of return that the utility should be allowed the opportunity to earn after recovery of the expenses of utility operations. The legal standards applicable to this

determination are set forth in *Fed. Power Comm'n v. Hope Natural Gas Co.*, 320 U.S. 591, 602-603 (1944) and *Bluefield Water Works and Improvement Co. v. Pub. Serv. Comm'n of W. VA.*, 262 U.S. 679, 692-93 (1923). These standards were adopted by the South Carolina Supreme Court in *Southern Bell Tel. & Tel. Co. v. S.C. Pub. Serv. Comm'n*, 270 S.C. 590, 595-96, 244 S.E.2d 278, 281 (1978). The Court stated:

What annual rate will constitute just compensation depends upon many circumstances, and must be determined by the exercise of a fair and enlightened judgment, having regard to all relevant facts. A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties; but it has no constitutional right to profits such as are realized or anticipated in highly profitable enterprises or speculative ventures. The return should be reasonably sufficient to assure confidence in the financial soundness of the utility and should be adequate, under efficient and economical management, to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties...

*Southern Bell Tel.*, 270 S.C. at 595-96, 244 S.E.2d at 281 (quoting *Bluefield*, 262 U.S. at 692-93). These cases also establish that the process of determining rates of return requires the exercise of informed judgment by the Commission. The South Carolina Supreme Court has held that:

[T]he Commission was not bound to the use of any single formula or combination of formulae in determining rates. Its ratemaking function, moreover, involves the making of 'pragmatic adjustments' . . . . Under the statutory standard of 'just and reasonable' it is the result reached not the method employed which is controlling. . . . The ratemaking process under the Act, *i.e.*, the fixing of 'just and reasonable' rates, involves the balancing of the investor and the consumer interests. Thus we stated in the *Natural Gas Pipeline Co.* case that 'regulation does not insure that the business shall produce net revenues.' . . . [B]ut such considerations aside, the investor interest has a legitimate concern with the financial integrity of the company whose rates are being regulated. From the investor or company point of view it is important that there be enough revenue not only for operating expenses but also for the capital costs of the business. These include service on debt and dividends on the stock. . . . By that standard the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital.

Southern Bell Tel., 270 S.C. at 596-97, 244 S.E. 2d at 281 (quoting Hope Natural Gas Co., 320 U.S. at 602-03). These principles have been employed by the Commission and the South Carolina Courts consistently.

The three economic and financial parameters in the *Bluefield* and *Hope* decisions – comparable earnings, financial integrity, and capital attraction – reflect the economic criteria encompassed in the “opportunity cost” principle of economics. The opportunity-cost principle provides that a utility and its investors should be afforded an opportunity (not a guarantee) to earn a return commensurate with returns they could expect to achieve on investments of similar risk. The opportunity-cost principle is consistent with the fundamental premise on which regulation rests, namely, that it is intended to act as a surrogate for competition.

**Q. HOW CAN THE *BLUEFIELD* AND *HOPE* PARAMETERS BE EMPLOYED TO ESTIMATE THE COST OF CAPITAL FOR A UTILITY?**

**A.** Neither the courts nor economic/financial theory has developed exact and mechanical procedures for precisely determining the cost of capital. This is the case because the cost of capital is an opportunity cost and is prospective-looking, which dictates that it must be estimated. However, there are several useful models that can be employed to assist in estimating the cost of common equity (“return on equity” or “ROE”), which is the capital cost component that is the most difficult to estimate. These include the DCF, CAPM, CE, and risk premium (“RP”) methods. I have not directly employed a RP model in my analyses although, as discussed later, my CAPM analysis is a form of the RP methodology. I describe each of these methodologies in more detail later in my testimony.

**IV. GENERAL ECONOMIC CONDITIONS**

**Q. ARE ECONOMIC AND FINANCIAL CONDITIONS IMPORTANT IN DETERMINING THE COSTS OF CAPITAL FOR A PUBLIC UTILITY?**



1     **A.**             Yes. The costs of capital for both fixed-cost (debt and preferred stock) components  
2             and common equity are determined in part by current and prospective economic and  
3             financial conditions. At any given time, each of the following factors has an influence on  
4             the costs of capital:

- 5             • The level of economic activity (*i.e.*, growth rate of the economy);
- 6             • The stage of the business cycle (*i.e.*, recession, expansion, or transition);
- 7             • The level of inflation;
- 8             • The level and trend of interest rates; and,
- 9             • Current and expected economic conditions.

10            My understanding is that this position is consistent with the *Bluefield* decision,  
11            which noted “[a] rate of return may be reasonable at one time and become too high or too  
12            low by changes affecting opportunities for investment, the money market, and business  
13            conditions generally.”<sup>4</sup>

14     **Q.     WHAT INDICATORS OF ECONOMIC AND FINANCIAL ACTIVITY DID YOU**  
15     **EVALUATE IN YOUR ANALYSES?**

16     **A.**             I examined several sets of economic statistics from 1975 to the present. I chose  
17             this time period because it permits the evaluation of economic conditions over four full  
18             business cycles, plus the current cycle, allowing for an assessment of changes in long-term  
19             trends. Consideration of economic/financial conditions over a relatively long period of  
20             time allows me to assess how such conditions have impacted the level and trends of the  
21             costs of capital. This period also approximates the beginning and continuation of active  
22             rate case activities by public utilities that generally began in the mid-1970s.

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<sup>4</sup> *Bluefield*, 262 U.S. at 693.

A business cycle is commonly defined as a complete period of expansion (recovery and growth) and contraction (recession). A full business cycle is a useful and convenient period over which to measure levels and trends in long-term capital costs because it incorporates the cyclical (*i.e.*, stage of business cycle) influences and, thus, permits a comparison of structural (or long-term) trends.

**Q. PLEASE DESCRIBE THE TIMEFRAMES OF THE FOUR PRIOR BUSINESS CYCLES AND THE CURRENT CYCLE.**

**A.** The four prior complete cycles and current cycle cover the following periods:

Business Cycle	Expansion Cycle	Contraction Period
1975-1982	Mar. 1975-July 1981	Aug. 1981-Oct. 1982
1982-1991	Nov. 1982-July 1990	Aug. 1990-Mar. 1991
1991-2001	Mar. 1991-Mar. 2001	Apr. 2001-Nov. 2001
2001-2009	Nov. 2001-Nov. 2007	Dec. 2007-June 2009
Current	July 2009 -	

Source: The National Bureau of Economic Research, "U.S. Business Cycle Expansions and Contractions."<sup>5</sup>

**Q. DO YOU HAVE ANY GENERAL OBSERVATIONS CONCERNING THE RECENT TRENDS IN ECONOMIC CONDITIONS AND THEIR IMPACT ON CAPITAL COSTS OVER THIS BROAD PERIOD?**

**A.** Yes, I do. From the early 1980s until the end of 2007, the United States economy enjoyed general prosperity and stability. This period was characterized by longer economic expansions, relatively tame contractions, low and declining inflation, and declining interest rates and other capital costs.

However, in 2008 and 2009 the economy declined significantly, initially as a result of the 2007 collapse of the "sub-prime" mortgage market and the related liquidity crisis in

<sup>5</sup> <http://www.nber.org/cycles/cyclesmain.html>.

1 the financial sector of the economy. Subsequently, this financial crisis intensified with a  
2 more broad-based decline initially based on a substantial increase in petroleum prices and  
3 a dramatic decline in the U.S. financial sector of the economy.

4 This decline has been described as the worst financial crisis since the Great  
5 Depression of the 1930s and has been referred to as the “Great Recession.” Beginning in  
6 2008, the U.S. and other governments implemented unprecedented policies to attempt to  
7 correct or minimize the scope and effects of this recession. Some of these policies are still  
8 in effect.

9 **Q. PLEASE DESCRIBE RECENT AND CURRENT ECONOMIC AND FINANCIAL**  
10 **CONDITIONS AND THEIR IMPACT ON THE COSTS OF CAPITAL.**

11 **A.** One impact of the Great Recession has been a reduction in actual and expected  
12 investment returns and a corresponding reduction in capital costs. This decline is  
13 evidenced by a decline in both short-term and long-term interest rates and the expectations  
14 of investors and is reflected in cost of capital model results (such as DCF, CAPM, and CE).  
15 Regulatory agencies throughout the U.S. have recognized the decline in capital costs by  
16 authorizing lower ROEs for regulated utilities in each of the last several years.<sup>6</sup>

17 Schedule 2 of Exhibit DCP-2 shows several sets of relevant economic and financial  
18 statistics for the cited time periods. Page 1 contains general macroeconomic statistics, page  
19 2 shows interest rates, and page 3 contains equity market statistics.

20 Page 1 shows that in 2007 the economy stalled and subsequently entered a  
21 significant decline, as indicated by the lower growth rate in real (*i.e.*, adjusted for inflation)  
22 Gross Domestic Product (“GDP”), lower levels of industrial production, and an increase in

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<sup>6</sup> Regulatory Research Associates, “Regulatory Focus.” January 31, 2019.

1 the unemployment rate. This recession lasted until mid-2009, making it a longer-than-  
2 normal, as well as a much deeper, recession. Since then, economic growth has been  
3 somewhat erratic, and the economy has grown more slowly than in prior expansions.

4 Page 1 also shows the rate of inflation. As reflected in the Consumer Price Index  
5 (“CPI”), inflation rose significantly during the 1975-1982 business cycle and reached  
6 double-digit levels in 1979-1980. The rate of inflation has declined substantially since  
7 1981. Since 2008, the CPI has been 3 percent or lower on an annual basis, with 2014 and  
8 2015 growth below 1 percent, 2016 and 2017 growth at 2.1 percent, and 2018 growth at  
9 1.9 percent. It is thus apparent that the rate of inflation has generally been declining over  
10 the past several business cycles. Recent and current levels of inflation are at the lowest  
11 levels of the past 35 years, which is reflective of lower capital costs.<sup>7</sup>

12 **Q. WHAT HAVE BEEN THE TRENDS IN INTEREST RATES OVER THE FOUR**  
13 **PRIOR BUSINESS CYCLES AND AT THE CURRENT TIME?**

14 **A.** Page 2 shows several series of interest rates. Both short-term and long-term rates  
15 rose sharply to record levels in 1975-1982 when the inflation rate was high. Interest rates  
16 have declined substantially in conjunction with the corresponding declines in inflation  
17 since the early 1980s.

18 From 2008 to late 2015, the Federal Reserve System (“Federal Reserve”)  
19 maintained the Federal Funds rate (*i.e.*, short-term interest rate) at 0.25 percent, an all-time  
20 low. Following much anticipation, the Federal Reserve has subsequently raised the Federal

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<sup>7</sup> The rate of inflation is one component of interest rate expectations of investors, who generally expect to receive a return in excess of the rate of inflation. Thus, a lower rate of inflation has a downward impact on interest rates and other capital costs.

Funds rate on nine occasions between December of 2015 and December of 2018.<sup>8</sup> The Federal Reserve also purchased U.S. Treasury securities to stimulate the economy.<sup>9</sup>

As seen on page 2, since 2011 both U.S. and public utility bond yields have declined to their lowest levels in the past four business cycles and in more than 35 years. Even with the “tapering” and eventual ending of the Federal Reserve’s Quantitative Easing program, as well as the Federal Reserve’s raising of the Federal Funds rate, interest rates have remained relatively low. The rates on U.S. Treasury and public utility securities increased somewhat in the first several months of 2018, before falling over the past few months. Despite this, both government and utility long-term lending rates remain near historically low levels, again reflective of lower capital costs.

**Q. WHAT DOES SCHEDULE 2 SHOWS FOR TRENDS OF COMMON SHARE PRICES?**

**A.** Page 3 shows several series of common stock prices and ratios. These indicate that stock prices were essentially stagnant during the high inflation/high interest rate environment of the late 1970s and early 1980s. The 1983-1991 business cycle and the more recent cycles witnessed a significant upward trend in stock prices. The beginning of the recent financial crisis saw stock prices decline precipitously as stock prices in 2008 and early 2009 were down significantly from peak 2007 levels, reflecting the financial/economic crisis. Beginning in the second quarter of 2009, prices recovered substantially and ultimately reached and exceeded the levels achieved prior to the “crash.”

<sup>8</sup> The Fed Funds increases took place in December 2015, December 2016, March 2017, June 2017, December 2017, March 2018, June 2018, September 2018, and December 2018.

<sup>9</sup> This is referred to as Quantitative Easing which was comprised of three “rounds”. In “round” 3, known as QE3, the Federal Reserve initially purchased some \$85 billion of U.S. Treasury Securities per month in order to stimulate the economy. The Federal Reserve eventually “tapered” its purchase of U.S. Treasury securities through October 2014, at which time Quantitative Easing ended.

On the other hand, recent equity markets have been somewhat volatile, including much of 2018. As an example of this, the end of 2018 witnessed significant declines in stock prices, with many indexes declining more than 20 percent (*i.e.*, a “bear” market).

**Q. WHAT CONCLUSIONS DO YOU DRAW FROM YOUR DISCUSSION OF ECONOMIC AND FINANCIAL CONDITIONS?**

**A.** Recent economic and financial circumstances have differed from any that have prevailed since at least the 1930s. Concurrent with the Great Recession, there was a decline in capital costs and returns which significantly reduced the value of most retirement accounts, investment portfolios, and other assets. One significant aspect of this has been a decline in investor expectations of returns<sup>10</sup> even with the return of stock prices to levels achieved prior to the “crash.”<sup>11</sup> This is evidenced by: (1) lower interest rates on bank deposits; (2) lower interest rates on U.S. Treasury and utility bonds; and (3) lower authorized returns on equity by regulatory commissions. Finally, as noted above, utility bond interest rates are currently at levels well below those prevailing prior to the financial crisis of late 2008 to early 2009 and, despite recent increases, remain near the lowest levels in the past 35 years and are also generally lower than the embedded cost rates for most utilities.

**Q. HOW DO THESE ECONOMIC/FINANCIAL CONDITIONS IMPACT THE DETERMINATION OF A RETURN ON EQUITY FOR REGULATED UTILITIES?**

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<sup>10</sup> See, e.g., Kiplinger’s Personal Finance, “Investors Brace for Smaller Gains, Focus on Long-Term,” August 30, 2015.

<sup>11</sup> See e.g., Vanguard News & Perspectives. “Stabilization, Not Stagnation: Expect Modest Returns,” March 30, 2017, [www.personal.vanguard.com/us/insights/artical/infographic-stabilization-032017](http://www.personal.vanguard.com/us/insights/artical/infographic-stabilization-032017).

A. The costs of capital for regulated utilities have declined in recent years. In addition, the results of the traditional cost of equity models (*i.e.*, DCF, CAPM, and CE) are lower than was the case prior to the Great Recession. In light of this, it is not surprising that the average returns on equity authorized by state regulatory agencies have declined and continued to remain relatively low through 2018, as follows:<sup>12</sup>

	Electric		Natural Gas		Water <sup>13</sup>
	Average	Median	Average	Median	Average
2007	10.32%	10.23%	10.22%	10.20%	10.45%
2008	10.37%	10.30%	10.39%	10.45%	10.11%
2009	10.52%	10.50%	10.22%	10.26%	10.11%
2010	10.29%	10.26%	10.15%	10.10%	10.08%
2011	10.19%	10.14%	9.91%	10.05%	10.06%
2012	10.02%	10.00%	9.93%	10.00%	10.06%
2013	9.82%	9.82%	9.68%	9.72%	9.97%
2014	9.76%	9.75%	9.78%	9.78%	9.87%
2015	9.60%	9.53%	9.60%	9.68%	9.83%
2016	9.60%	9.60%	9.53%	9.50%	9.49%
2017	9.68%	9.60%	9.73%	9.60%	9.69%
2018	9.56%	9.57%	9.60%	9.60%	---

## V. PALMETTO WASTEWATER RECLAMATION, LLC'S OPERATIONS AND CAPITAL STRUCTURE/COST OF DEBT

### Q. PLEASE DESCRIBE PWR AND ITS OPERATIONS.

A. PWR is a regulated wastewater treatment utility that operates in two areas of South Carolina: Alpine and Woodland (formerly Alpine Utilities, Inc. and Woodland Utilities, Inc., which were separate public utility companies before being acquired in 2011 by PWR's

<sup>12</sup> Regulatory Research Associates, "Regulatory Focus", January 31, 2019, General Rate Cases, for source of electric and natural gas authorized returns on equity.

<sup>13</sup> These ROEs reflect the existing "Allowed Return on Equity" as of each cited year, which are not reflective of the newly-authorized ROEs decided during each of the cited years.

parent and transferred to PWR). Since 2014 these systems have been consolidated and operate as PWR.<sup>14</sup>

**Q. WHAT IS THE OWNERSHIP STRUCTURE OF PWR?**

**A.** PWR is a direct subsidiary of Ni South Carolina, LLC, which in turn is a subsidiary of Ni Pacolet Milliken Utilities, LLC (“Ni”), which is a subsidiary of Pacolet Milliken, LLC, which is a subsidiary of Pacolet Milliken Enterprises, Inc. (“PUI”, a privately-owned holding company). Ni Pacolet Milliken Utilities also has other South Carolina operations: Ni South Carolina Utilities, Inc., which owns 1710 Woodcreek Farms Road, LLC, and Palmetto Utilities, Inc. In addition, Ni has utility subsidiaries in Florida and Texas.<sup>15</sup> Pacolet Milliken Enterprises also owns Lockhart Power Co., which is a regulated electric utility that operates in South Carolina.

**Q. DOES PWR HAVE DEBT RATINGS?**

**A.** No, it does not.<sup>16</sup> PWR’s debt is in the form of Bank of America Term Loans and intercompany loans through Ni.

**Q. HAVE YOU EVALUATED THE CAPITAL STRUCTURE OF PWR?**

**A.** Yes. I have examined the five-year historic (2014-2018) capital structure ratios of PWR. These are shown on Page 1 of Schedule 3 of Exhibit DCP-2. I have summarized below the common equity ratios for PWR including and excluding short-term debt:

Year	Incl. S-T Debt	Excl. S-T Debt
2014	29.7%	31.4%
2015	60.9%	62.2%
2016	57.8%	59.2%
2017	46.7%	47.6%
2018	60.9%	62.2%

<sup>14</sup> Direct Testimony of PWR witness Mark S. Daday, page 3, lines 2-8.

<sup>15</sup> Response to ORS 1-9.

<sup>16</sup> Response to ORS 1-70(c).



Two aspects of PWR's capital structure ratios are apparent. First, the respective equity ratios are quite variable from year-to-year, as they have ranged from 30 percent to over 61 percent. Second, a substantial portion of PWR's capital is in the form of "advances from affiliates."

Page 2 of Schedule 3 shows the capital structures of Ni over past three years. This indicates the following equity ratios:

Year	Incl. S-T Debt	Excl. S-T Debt
2016	73.3%	74.9%
2017	79.7%	81.2%
9/30/18	81.6%	83.2%

**Q. HAVE YOU ALSO CONDUCTED ANALYSES OF THE HISTORIC AND PROJECTED COMMON EQUITY RATIOS OF THE PROXY GROUPS USED TO ESTIMATE PWR'S COST OF EQUITY?**

**A.** Yes, I have. Schedule 4 of Exhibit DCP-2 shows the five-year historic (2014-2018) and estimated (2021-2023) common equity ratios (excluding short-term debt) for the proxy groups' water utilities identified in a later section of my testimony. The summary results are as follows:

Group	Five-Year Historic		2021-23 Estimated	
	Average	Median	Average	Median
Value Line Group	54.4%	55.1%	55.3%	54.5%
Parcell Group	56.1%	57.4%	57.5%	62.5%
Walker Group	54.5%	55.8%	55.4%	54.0%

These results indicate average and median common equity ratios between 54 percent and 56 percent, with one exception. These are lower than PWR's ratios.

**Q. WHAT CAPITAL STRUCTURE HAS PWR REQUESTED IN THIS PROCEEDING?**

**A.** PWR is proposing the use of its actual Test Year (August 31, 2018) capital structure ratios, which are 40.28 percent debt and 59.72 percent equity.

**Q. DOES THIS PROPOSED CAPITAL STRUCTURE REPRESENT AN APPROPRIATE CAPITAL STRUCTURE FOR PWR AT THIS TIME?**

**A.** No, it does not. As I indicated above, PWR has historically employed a highly volatile capital structure. Its proposed capital structure contains more equity than most water utilities, as shown on Schedule 4 of Exhibit DCP-2. In addition, as noted above, PWR has a substantial portion of its capital provided from advances from affiliates. As a result, the actual capital structure of PWR cannot be described as a “market-driven” capital structure, as are the groups of proxy water utilities used in my testimony to estimate PWR’s cost of equity.

**Q. WHAT CAPITAL STRUCTURE DO YOU USE IN YOUR COST OF CAPITAL ANALYSES?**

**A.** I propose that the Commission utilize a capital structure with 55 percent equity and 45 percent debt. This reflects the average capital structure ratios of the proxy groups of water utilities (*i.e.*, a “market-driven” capital structure).

**Q. WHAT IS THE COST OF DEBT OF PWR?**

**A.** The Company’s testimony utilizes a cost of long-term debt of 5.04 percent – the cost as of August 31, 2018.

**Q. WHAT COST OF DEBT DO YOU UTILIZE IN YOUR COST OF CAPITAL ANALYSES?**

1 A. I use this cost rate in my analyses.

2 **VII. SELECTION OF PROXY GROUPS**

3 **Q. HOW HAVE YOU ESTIMATED THE COST OF EQUITY FOR PWR?**

4 A. PWR is a subsidiary of Ni and is not publicly-traded. Consequently, it is not  
5 possible to directly apply cost of equity models to this entity. Generally, groups of  
6 comparison or “proxy” companies are analyzed as a substitute for PWR to determine its  
7 cost of common equity.

8 I have examined three such groups for comparison of PWR. I selected one group  
9 of water utilities covered by Value Line (Standard Edition) and using the criteria listed on  
10 Schedule 5 of Exhibit DCP-2. These criteria are as follows:

- 11 (1) Primarily a regulated water utility in U.S.;
- 12 (2) Common equity ratio 40 percent or greater;
- 13 (3) Value Line Safety of 2 or 3;
- 14 (4) S&P’s bond ratings of A or AA;
- 15 (5) Currently pays dividends and has not reduced dividends in past five years; and,
- 16 (6) Not currently involved in major merger.

17 Second, I have conducted studies of the cost of equity for the water utilities group  
18 cited by Value Line. I note that the Value Line group contains two companies (*i.e.*,  
19 Connecticut Water and SJW Corp.) that are presently involved in merger activities with  
20 each other. In addition, Aqua America is currently in the process of acquiring several  
21 natural gas utilities.

22 Third, I have also considered the proxy group of water utilities employed by PWR  
23 witness Walker in his analyses. In doing so, I note that two of the companies he considers,

Aqua America and SJW Group, are currently involved in major mergers and thus, do not appear to satisfy one of the criteria Mr. Walker notes as a proxy group screening criterion (*i.e.*, “are not the announced subject of an acquisition”).<sup>17</sup>

**Q. DO YOU BELIEVE THAT PWR HAS SIMILAR RISK TO THAT OF YOUR GROUPS OF PROXY WATER UTILITIES?**

**A.** I believe that is generally true. I note that Mr. Walker shares this view with his proxy water group.<sup>18</sup>

### **VIII. DISCOUNTED CASH FLOW ANALYSIS**

**Q. WHAT IS THE THEORY AND METHODOLOGICAL BASIS OF THE DCF MODEL?**

**A.** The DCF model is one of the oldest and most commonly-used models for estimating the ROE for public utilities. The DCF model is based on the “dividend discount model” of financial theory, which maintains that the value (price) of any security or commodity is the discounted present value of all future cash flows.

The DCF model is based upon two fundamental principles. First, DCF is based on the postulate that investors value an asset on the basis of the future cash flows (*i.e.*, dividends and ultimate sales in the case of common stocks) they expect to receive from owning the asset. The second DCF principle is that investors value a dollar received in the future less than a dollar received today (*i.e.*, the “time value of money”). Within this context, the current price of a company’s stock is equal to the present value equivalent of the expected dividends and the proceeds from eventually selling the stock. The discount

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<sup>17</sup> Direct Testimony of Harold Walker, page 11, lines 1-2.

<sup>18</sup> Direct Testimony of Harold Walker, page 22, lines 3-4.

rate that equates the future anticipated dividends and future anticipated selling price with the current market price is the cost of common equity.

The DCF model is based upon the concept that the value of a share of stock is the discounted present worth of all the dividends to be received on that share. The equation is:

$$P = \frac{C_1}{(1 + K_1)} + \frac{C_2}{(1 + K_2)^2} + \dots + \frac{C_n}{(1 + K_n)^n}$$

where: P = current value or price

C<sub>1</sub> = cash flow in period 1, etc.

K<sub>1</sub> = discount rate in period 1, etc.

n = infinity

This relationship can be simplified if dividends are assumed to grow at a constant rate of g. As a result, the equation above can be reduced to:

$$P = \frac{D}{(K - g)}$$

which, when solved for K results in:

$$K = \frac{D}{P} + g$$

where: P = current price

D = current dividend rate

K = discount rate (cost of capital)

g = constant rate of expected growth

This formula essentially recognizes that the return expected or required by investors is comprised of two factors: the dividend yield (current income) and expected growth in dividends (future income).

**Q. PLEASE EXPLAIN HOW YOU EMPLOY THE DCF MODEL.**

**A.** I use the constant growth DCF model. In doing so, I combine the current dividend yield for each of the proxy utility stocks described in the previous section with several indicators of expected dividend growth.

**Q. HOW DID YOU DERIVE THE DIVIDEND YIELD COMPONENT OF THE DCF EQUATION?**

**A.** Several methods can be used to calculate the dividend yield component. These methods generally differ in the manner in which the dividend rate is employed (i.e., current versus future dividends or annual versus quarterly compounding variant). I use a version of the quarterly compounding variant, which is expressed as follows:

$$Yield = \frac{D_0(1 + 0.5g)}{P_0}$$

This dividend yield component recognizes the timing of dividend payments and dividend increases.

The  $P_0$  in my yield calculation is the average of the high and low stock price for each proxy company for the most recent three-month period (December 2018 – February 2019). The  $D_0$  is the current annualized dividend rate for each proxy company.

**Q. HOW DO YOU ESTIMATE THE DIVIDEND GROWTH COMPONENT OF THE DCF EQUATION?**

**A.** The DCF model's dividend growth rate component is usually the most crucial and controversial element involved in using this methodology. The objective of estimating the dividend growth component is to reflect the growth expected by investors that is embodied in the price (and yield) of a company's stock. As such, it is important to recognize that individual investors have different expectations and consider alternative indicators in

1 deriving their expectations. This is evidenced by the fact that every investment decision  
2 resulting in the purchase of a particular stock is matched by another investment decision to  
3 sell that stock.

4 A wide array of indicators exists for estimating investors' growth expectations. As  
5 a result, it is evident that investors do not always use one single indicator of growth. It  
6 therefore is necessary to consider alternative dividend growth indicators in deriving the  
7 growth component of the DCF model. I have considered five indicators of growth in my  
8 DCF analyses. These are:

- 9 1. Years 2014-2018 (5-year average) earnings retention, or fundamental growth (per  
10 Value Line);
- 11 2. Five-year average of historic growth in earnings per share (EPS), dividends per share  
12 (DPS), and book value per share (BVPS) (per Value Line);
- 13 3. Years 2019 and 2021-2023 projections of earnings retention growth (per Value Line);
- 14 4. Years 2015-2017 to 2021-2023 projections of EPS, DPS, and BVPS (per Value Line);  
15 and,
- 16 5. Five-year projections of EPS growth (per First Call).

17 I believe this combination of growth indicators is a representative and appropriate  
18 set with which to begin the process of estimating investor expectations of dividend growth  
19 for the groups of proxy companies. I also believe that these growth indicators reflect the  
20 types of information that investors consider in making their investment decisions. As I  
21 indicated previously, investors have an array of information available to them, all of which  
22 would be expected to have some impact on their decision-making process.

23 **Q. PLEASE DESCRIBE YOUR DCF CALCULATIONS.**

A. Schedule 6 of Exhibit DCP-2 presents my DCF analysis. Page 1 shows the calculation of the “raw” (i.e., prior to adjustment for growth) dividend yield for each proxy company. Pages 2 and 3 show the growth rates for the groups of proxy companies. Page 4 shows the DCF calculations, which are presented on several bases: mean, median, low and high values. These results can be summarized as follows:

	Mean	Median	Mean Low <sup>19</sup>	Mean High <sup>20</sup>	Median Low <sup>21</sup>	Median High <sup>22</sup>
Value Line Group	8.2%	7.6%	6.8%	9.1%	6.1%	8.7%
Parcell Group	7.5%	7.4%	6.1%	8.7%	5.8%	8.1%
Walker Group	8.3%	7.8%	6.9%	9.2%	6.2%	9.2%

I note that the individual DCF calculations shown on Schedule 6 should not be interpreted to reflect the expected cost of capital for individual companies in the proxy groups; rather, the individual values shown should be interpreted as alternative information considered by investors.

**Q. WHAT DO YOU CONCLUDE FROM YOUR DCF ANALYSES?**

A. The DCF rates resulting from the analysis of the proxy groups fall into a wide range between 5.8 percent and 9.2 percent. The highest DCF rates are 8.1 percent to 9.2 percent.

I believe a range of 8.1 percent to 9.2 percent represents the current DCF-derived ROE for the proxy groups at this time. This range includes the highest DCF rate and exceeds the low and mean and median DCF rates. I recommend a DCF ROE of 9.2 percent

<sup>19</sup> Using the lowest mean growth rate.

<sup>20</sup> Using the highest mean growth rate.

<sup>21</sup> Using the lowest median growth rate.

<sup>22</sup> Using the highest median growth rate.



1 for PWR, which focuses on the highest DCF rates (*i.e.*, range of 8.1 percent to 9.2 percent)  
2 and exceeds the low and mean and median DCF rates.

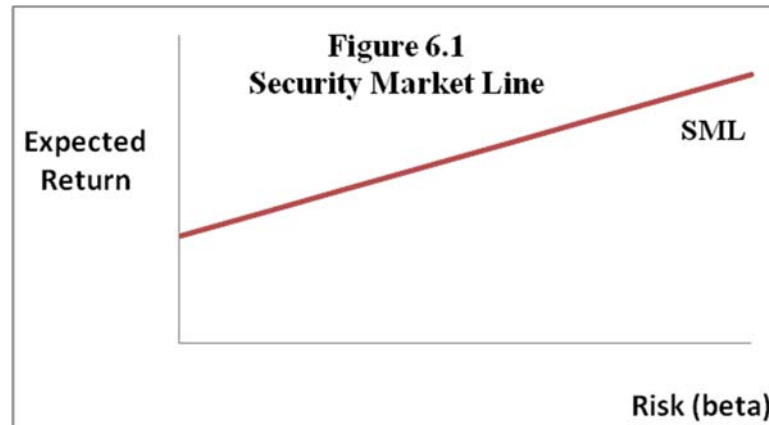
3 I observe that the constant growth DCF model currently produces cost of equity  
4 results that are lower than has been the case in recent years. This is, in part, a reflection of  
5 the decline in capital costs (e.g., in terms of interest rates). I believe that the constant-  
6 growth DCF model remains relevant and informative. It is also my personal experience  
7 that this model is used the most by cost of capital witnesses of all the available ROE  
8 models. Nevertheless, in order to be conservative and give some consideration to any  
9 perceived unique attributes of PWR, I have focused only on the highest of the DCF results  
10 in making my recommendations. As such, I have not given consideration to the lower  
11 calculated DCF results.

12 **X. CAPITAL ASSET PRICING MODEL ANALYSIS**

13 **Q. PLEASE DESCRIBE THE THEORY AND METHODOLOGICAL BASIS OF THE**  
14 **CAPM.**

15 **A.** The CAPM describes the relationship between a security's investment risk and its  
16 market rate of return. This relationship identifies the rate of return which investors expect  
17 a security to earn so that its market return is comparable with the market returns earned by  
18 other securities that have similar risk.

19 The relationship is specified by the Security Market Line (SML). As indicated in  
20 the figure below, the SML indicates the relationship between each security's or portfolio's  
21 "beta" and its resulting expected return. The SML sets forth the "betas" and corresponding  
22 expected returns of all securities and portfolios of securities that are available in the capital  
23 market at a given moment in time.



2 Beta is an indicator of investment risk. It is a measure of the expected amount of  
3 change in a security's price that results from a change in the overall market's security  
4 prices. As such, beta indicates the security's variability of return relative to the return  
5 variability of the overall capital market.

6 Variability of market returns is a measure of risk and is caused by two general  
7 factors. First, changes in economic, social, and political conditions affect the risk structure  
8 and market prices of all securities. Changes in these factors consequently cause the market  
9 return to vary. This is referred to as market risk or systematic risk. Second, each company  
10 and industry have unique business and financial attributes, which also cause returns and  
11 prices to vary. This is known as firm-specific risk or unsystematic (or non-systematic)  
12 risk.

13 Investors can, through diversification of their security holdings, substantially  
14 reduce or eliminate the return variation caused by the second general factor (i.e., the unique  
15 business and financial attributes). However, the return variance or risk caused by the first  
16 factor (changes in economic, social, and political conditions) cannot be eliminated because  
17 changes in these factors impact all securities to some degree.

Consequently, in a diversified portfolio of securities, it is the risk associated with the first factor that commands the return premium to attract investor capital. Beta, a measure of a security's return variability relative to the return variability of the market as a whole, is an indicator of the risk associated with the first factor. The SML specifies the relationship between the non-diversifiable or systematic risk and the return premium required to be comparable with other securities of similar risk. This relationship is known as CAPM.

**Q. HOW IS THE CAPM DERIVED?**

**A.** The general form of the CAPM is:

$$K = R_f + \beta(R_m - R_f)$$

where: K = cost of equity

$R_f$  = risk free rate

$R_m$  = return on market

$\beta$  = beta

$R_m - R_f$  = market risk premium

The CAPM is a variant of the risk premium ("RP") method. I believe the CAPM is generally superior to the simple RP method because the CAPM specifically recognizes the risk of a particular company or industry (*i.e.*, beta), whereas the simple RP method assumes the same cost of equity for all companies exhibiting similar bond ratings or other characteristics.

**Q. WHAT DO YOU USE FOR THE RISK-FREE RATE?**

**A.** The first input of the CAPM is the risk-free rate ( $R_f$ ). The risk-free rate reflects the level of return that can be achieved without accepting any risk.

1 In CAPM applications, the risk-free rate is generally recognized by use of U.S.  
2 Treasury securities. Two general types of U.S. Treasury securities are often utilized as the  
3  $R_f$  component -- short-term U.S. Treasury bills and long-term U.S. Treasury bonds.

4 I have performed CAPM calculations using the three-month average yield  
5 (December 2018 - February 2019) for 20-year U.S. Treasury bonds. I use the yields on  
6 long-term Treasury bonds since this matches the long-term perspective of ROE analyses.  
7 Over this three-month period, these bonds had an average yield of 2.91 percent.

8 **Q. WHAT IS BETA AND WHAT BETAS DO YOU EMPLOY IN YOUR CAPM?**

9 **A.** Beta is a measure of the relative volatility (and thus risk) of a particular stock in  
10 relation to the overall market. Betas less than 1.0 are considered less risky than the market,  
11 whereas betas greater than 1.0 are riskier. Utility stocks traditionally have had betas below  
12 1.0. I utilize the most recent Value Line betas for each company in the proxy groups.

13 **Q. HOW DO YOU ESTIMATE THE MARKET RISK PREMIUM COMPONENT?**

14 **A.** The market risk premium component ( $R_m - R_f$ ) represents the investor-expected  
15 premium of common stocks over the risk-free rate, or long-term government bonds. For  
16 the purpose of estimating the market risk premium, I considered alternative measures of  
17 returns of the S&P 500 (a broad-based group of large U.S. companies) and 20-year U.S.  
18 Treasury bonds (*i.e.*, the same timeframe as employed in the Duff & Phelps source<sup>23</sup> used  
19 to develop risk premiums).

20 First, I compared the actual annual returns on equity of the S&P 500 with the actual  
21 annual yields of U.S. Treasury bonds. Schedule 7 of Exhibit DCP-2 shows the earned  
22 returns on equity for the S&P 500 group for the period 1978-2017 (all available years

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<sup>23</sup> 2018 SBBI Yearbook, Stocks, Bonds, Bills and Inflation. U.S. Capital Markets Performance by Asset Class 1926-2017, Duff and Phelps.

1 reported by S&P). This schedule also indicates the annual yields on 20-year U.S. Treasury  
2 bonds and the annual differentials (i.e., risk premiums) between the S&P 500 and U.S.  
3 Treasury 20-year bonds. Based upon these returns, I conclude that the risk premium from  
4 this analysis is 7.11 percent.

5 I next considered the total returns (i.e., dividends/interest plus capital gains/losses)  
6 for the S&P 500 group as well as for long-term<sup>24</sup> government bonds, as tabulated by Duff  
7 & Phelps, using both arithmetic and geometric means. I considered the total returns for  
8 the entire 1926-2017 period, which are as follows:

	S&P 500	L-T Gov't Bonds	Risk Premium
Arithmetic	12.1%	6.0%	6.1%
Geometric	10.2%	5.5%	4.7%

9 I conclude from this analysis that the expected risk premium is about 6.0 percent  
10 (*i.e.*, the average of all three risk premiums: 7.11 percent from Schedule 7; 6.1 percent  
11 arithmetic and 4.7 percent geometric from Duff & Phelps). I believe that a combination of  
12 arithmetic and geometric means is appropriate since investors have access to both types of  
13 means<sup>25</sup> and presumably, both types are reflected in investment decisions and thus, stock  
14 prices and the cost of equity.

15 **Q. PLEASE DEFINE THE CONCEPTS OF ARITHMETIC MEAN AND**  
16 **GEOMETRIC MEAN AND DESCRIBE WHY BOTH ARE RELEVANT TO**  
17 **INVESTORS.**

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<sup>24</sup> 20 Year.

<sup>25</sup> For example, Value Line uses compound (*i.e.*, geometric) growth rates in its projection. In addition, mutual funds report growth rates on a compound basis.

A. The arithmetic mean is the average of period (*e.g.*, annual) changes in a statistic, such as investor returns. The geometric mean is a compound return of a period. The table below describes each for a sample period:

Period	Value	Return
1	\$10	
2	\$11	10% (\$1 return on \$10 base)
3	\$12	9% (\$1 return on \$11 base)
4	\$11	-8% (-\$1 loss on \$12 base)
5	\$12	9% (\$1 return on \$11 base)

In this example, the arithmetic return is the average of the annual “Return” figures, which is 5 percent (*i.e.*, 10% + 9% - 8% + 9% divided by 4). The arithmetic return thus gives consideration to the return level for each period.

The geometric return is the compound return over the four-year period, in which the value increased from \$10 to \$12, which is 20 percent over a four-year period, or 4.66 percent. The geometric mean thus is concerned with the total return over the period without consideration of individual period averages.

Arithmetic returns are always higher than geometric returns. This is the case since the individual period returns in an arithmetic sense are not “compounded” which requires them to be higher. Both types of returns are relevant to investors and both are reported to investors. Investors are concerned with period returns, but over a given period of time it is the geometric return that indicates their actual gain or loss. As a result, I consider both in my analyses of the risk premium component.

**Q. WHAT ARE YOUR CAPM RESULTS?**

A. Schedule 8 of Exhibit DCP-2 shows my CAPM calculations. The results are:

	Mean	Median
Value Line Group	6.9%	7.1%
Parcell Group	7.1%	7.1%
Walker Group	7.0%	7.1%

1  
2 **Q. WHAT IS YOUR CONCLUSION CONCERNING THE CAPM COST OF**  
3 **EQUITY?**

4 **A.** The CAPM results collectively indicate a cost of equity of 6.9 percent to 7.1 percent  
5 (7.0 percent mid-point) for the groups of proxy utilities. I conclude that an appropriate  
6 CAPM cost of equity estimation for PWR is 7.1 percent.

7 **X. COMPARABLE EARNINGS ANALYSIS**

8 **Q. PLEASE DESCRIBE THE BASIS OF THE CE METHODOLOGY.**

9 **A.** This method is based upon the economic concept of “opportunity cost.” As noted  
10 previously the cost of capital is an opportunity cost: the prospective return available to  
11 investors from alternative investments of similar risk. If, in the opinion of those who save  
12 and commit capital, the prospective return from a given investment is not equal to that  
13 available from other investments of similar risk, the available capital will tend to be shifted  
14 to the alternative investments. Through this mechanism, opportunity-cost-driven pricing  
15 signals direct capital to its most productive uses; thus, a free enterprise system promotes  
16 an efficient allocation of scarce resources.

17 The established legal standards are consistent with the opportunity cost principle.  
18 The two Supreme Court cases most frequently cited (*Bluefield* and *Hope*) hold that: the  
19 return to the equity owners be sufficient to maintain the credit of the enterprise and  
20 confidence in its financial integrity; to permit the enterprise to attract required additional  
21 capital on reasonable terms; and to provide the enterprise and its investors with an earnings

1 opportunity commensurate with the returns available on investments in other enterprises  
2 having corresponding risks.

3 These three interrelated criteria constitute a succinct statement of the opportunity  
4 cost principle. An expected return on equity equal to that which can be realized on  
5 alternative investments of corresponding risk will, in turn, be sufficient to assure  
6 confidence in the financial integrity of the enterprise, to maintain its credit, and to permit  
7 it to attract new capital on reasonable terms.

8 The CE method is designed to measure the returns expected to be earned on the  
9 original cost book value of similar risk enterprises. This method provides a direct measure  
10 of the fair return, since it translates into practice the competitive principle upon which  
11 regulation rests. Thus, it provides a direct measure of the fair return, since it translates into  
12 practice the competitive principle upon which regulation rests.

13 The CE method normally examines the experienced and/or projected return on book  
14 common equity. The logic for examining returns on book equity follows from the use of  
15 original cost rate base regulation for public utilities, which uses a utility's book common  
16 equity to determine the cost of capital. This cost of capital is, in turn, used as the fair rate  
17 of return which is then applied (multiplied) to the book value of rate base to establish the  
18 dollar level of capital costs to be recovered by the utility. This technique is thus consistent  
19 with the rate base, rate of return methodology used to set utility rates.

20 **Q. HOW DO YOU APPLY THE CE METHODOLOGY IN YOUR ANALYSIS OF**  
21 **PWR'S COST OF EQUITY?**

22 **A.** I apply the CE methodology by examining realized returns on equity ("ROEs") for  
23 the groups of proxy companies, as well as unregulated companies, and evaluating investor



1 acceptance of these returns by reference to the resulting market-to-book ratios (“M/Bs”).  
2 By use of this method, it is possible to assess the degree to which a given level of return  
3 equates to the cost of capital. It is generally recognized for utilities that an M/B of greater  
4 than one (*i.e.*, 100 percent) reflects a situation where a company is able to attract new equity  
5 capital without dilution (*i.e.*, above book value). As a result, one objective of a fair ROE  
6 is the maintenance of stock prices at or above book value. It is also apparent that a utility  
7 M/B significantly above 1.0 protects existing shareholders from “dilution” that occurs  
8 when new shares of equity are sold for a price less than book value.

9 I further note that my CE analysis is based upon market data (through the use of  
10 M/Bs) and is thus essentially a market test. As a result, my CE analysis is not subject to  
11 the criticisms occasionally made by some who maintain that past earned ROEs do not  
12 necessarily represent the cost of capital. In addition, my CE analysis also uses prospective  
13 returns and thus is not strictly backward looking.

14 **Q. IS YOUR CE ANALYSIS BASED UPON AN ASSUMPTION THAT ROES ARE**  
15 **THE ONLY FACTOR INFLUENCING STOCK PRICES AND M/BS?**

16 **A.** No, it is not. I do not assume that earned ROEs are the sole determinant of M/Bs.  
17 Rather, I demonstrate that M/Bs are important to public utilities and they correspondingly  
18 reflect investors’ assessment of the value of utility stocks relative to their respective book  
19 value, which is the basis on which their rates are established by regulatory commissions.

20 **Q. WHAT TIME PERIODS DO YOU EXAMINE IN YOUR CE ANALYSIS?**

21 **A.** My CE analysis considers the experienced ROEs of the proxy groups of utilities for  
22 the period 2002-2018 (*i.e.*, the last 17 years). The CE analysis requires that I examine a  
23 relatively long period of time in order to determine trends in earnings over at least a full

business cycle. Further, in estimating a fair level of return for a future period, it is important to examine earnings over a diverse period of time in order to avoid any undue influence from unusual or abnormal conditions that may occur in a single year or shorter period.

Therefore, in forming my judgment of the current ROE, I focused on two periods: 2009-2018 (the current business cycle) and 2002-2008 (the most recent past business cycle). I have also considered projected ROEs for 2019 and 2021-2023 (*i.e.*, the time periods estimated by Value Line).

**Q. PLEASE DESCRIBE YOUR CE ANALYSIS.**

**A.** Schedules 9 and 10 of Exhibit DCP-2 contain summaries of experienced ROEs and M/Bs for four groups of companies, while Schedule 11 of Exhibit DCP-2 presents a risk comparison of utilities versus unregulated firms.

Schedule 9 shows the achieved ROEs and M/Bs for the groups of proxy utilities. These can be summarized as follows:

	Value Line Group	Parcell Group	Walker Group
Historic ROE			
Mean	9.6-9.8%	9.3-9.7%	9.6-9.9%
Median	9.5-9.6%	9.1-9.4%	9.6%
Historic M/B			
Mean	226-240%	225-227%	229-242%
Median	211-232%	212-221%	214-234%
Prospective ROE			
Mean	11.7-12.9%	11.6-12.5%	11.9-13.2%
Median	11.8-12.8%	11.0-13.0%	12.5-13.0%

These results indicate that historic ROEs of 9.1 percent to 9.9 percent have been adequate to produce M/Bs of 211 percent to 242 percent for the groups of utilities. Furthermore, projected ROEs for 2019 and 2021-2023 are within a range of 11.0 percent

to 13.0 percent for the utility groups. These relate to 2018 M/Bs of 300 percent or greater.

**Q. DO YOU ALSO REVIEW THE EARNINGS OF UNREGULATED FIRMS?**

**A.** Yes. As an alternative, I also examine the S&P's 500 group. This is a well-recognized group of firms that is widely utilized in the investment community and is indicative of the competitive sector of the economy. Schedule 10 of Exhibit DCP-2 presents the earned ROEs and M/Bs for the S&P 500 group over the past 16 years (*i.e.*, 2002-2017). As this schedule indicates, over the two business cycle periods, this group's average ROEs ranged from 12.4 percent to 13.4 percent, with average M/Bs ranging between 242 percent and 275 percent.

**Q. HOW CAN THE ABOVE INFORMATION BE USED TO ESTIMATE PWR'S ROE?**

**A.** The recent and prospective ROEs of the proxy utilities and S&P 500 groups can be viewed as an indication of the level of return realized and expected in the regulated and competitive sectors of the economy. In order to apply these returns to the cost of equity for the proxy utilities, however, it is necessary to compare the risk levels of the water utilities and the competitive companies. I do this in Schedule 11 of Exhibit DCP-2, which compares several risk indicators for the S&P 500 group and the water utility groups. The information in this schedule indicates that the S&P 500 group is riskier than the water utility proxy groups.

**Q. WHAT ROE IS INDICATED BY YOUR CE ANALYSIS?**

**A.** Based on recent and prospective ROEs and M/Bs, my CE analysis indicates that the required ROE for the proxy utilities is no more than 9.0 percent to 10.0 percent (9.5 percent mid-point). Recent ROEs of 9.1 percent to 9.9 percent have resulted in M/Bs more

than 200 percent. Prospective ROEs of 11.0 percent to 13.0 percent have been accompanied by M/Bs over 300 percent. As a result, it is apparent that authorized returns below this level would continue to result in M/Bs of well above 200 percent. As I indicated earlier, the fact that M/Bs substantially exceed 100 percent indicates that historic and prospective ROEs of 9.5 percent reflect earning levels that are well above the actual earned ROE for those regulated companies. I also note that a company whose stock sells above book value can attract capital in a way that enhances the book value of existing stockholders, thus creating a favorable environment for financial integrity. My specific CE recommendation is the upper of this range, or 10.0 percent.

#### **XI. RETURN ON EQUITY RECOMMENDATION**

**Q. PLEASE SUMMARIZE THE RESULTS OF YOUR THREE COST OF EQUITY ANALYSES.**

**A.** My three cost of equity analyses produced the following:

	<u>Recommendation</u>
DCF	9.2%
CAPM	7.1%
CE	10.0%

These results indicate an overall broad range of 7.1 percent to 10.0 percent. I recommend a ROE range of 9.2 percent to 10.0 percent for PWR. This range includes my DCF result (9.2 percent), and my CE result (10.0 percent). Specifically, I recommend a cost of equity of 9.6 percent for PWR, the mid-point of this range.

**Q. IT APPEARS THAT YOUR CAPM RESULTS ARE LESS THAN YOUR DCF AND CE RESULTS. DO YOU DIRECTLY CONSIDER THE CAPM RESULTS IN DETERMINING THE COST OF EQUITY FOR PWR?**

1     **A.**             Not at this time. I have conducted CAPM studies in my cost of equity analyses for  
2             many years. It is apparent that the CAPM results are currently significantly less than the  
3             DCF and CE results. There are two reasons for the lower CAPM results. First, risk  
4             premiums are lower currently than was the case in prior years. This is the result of lower  
5             equity returns that have been experienced beginning with the Great Recession and  
6             continuing over the past several years. This is also reflective of a decline in investor  
7             expectations of equity returns and risk premiums. Second, the level of interest rates on  
8             U.S. Treasury bonds (i.e., the risk-free rate) has been lower in recent years. This is partially  
9             the result of the actions of the Federal Reserve to stimulate the economy. This also impacts  
10            investor expectations of returns in a negative fashion.

11           I note that, initially, investors may have believed that the decline in U.S. Treasury  
12           yields was a temporary factor that would soon be replaced by a rise in interest rates.  
13           However, this has not been the case as interest rates have remained low and continued to  
14           decline for most of the past seven-plus years. As a result, it cannot be maintained that low  
15           interest rates (and low CAPM results) are temporary and do not reflect investor  
16           expectations. Consequently, the CAPM results should be considered as one factor in  
17           determining the cost of equity for PWR. Even though I do not factor the CAPM results  
18           directly into my cost of equity recommendation, I do believe these lower results are  
19           indicative of the recent and continuing decline in utility costs of capital, including cost of  
20           equity.

## 21                               **XII. TOTAL COST OF CAPITAL**

22     **Q. WHAT IS THE TOTAL COST OF CAPITAL FOR PWR?**

A. Schedule 1 of Exhibit DCP-2 reflects the costs of capital for PWR using my proposed capital structure, embedded cost of debt, as well as my cost of equity recommendations. The resulting total cost of capital is a range of 7.33 percent to 7.77 percent for PWR. I recommend a cost of capital of 7.55 percent for PWR, which incorporates a cost of equity of 9.6 percent.

**XIII. COMMENTS ON PWR'S COST OF CAPITAL REQUESTS**

**Q. WHAT COST OF EQUITY HAS PWR RECOMMENDED IN THIS CASE?**

A. The Company is recommending that it be permitted a cost of common equity of 10.75 percent. The 10.75 percent requested ROE is developed in the testimony of PWR witness Walker.

**Q. WHAT IS THE BASIS FOR MR. WALKER'S COST OF EQUITY RANGE?**

A. PWR's return on equity request is developed in the testimony of Harold Walker as follows.<sup>26</sup>

Discounted Cash Flow Model	10.50%
Capital Asset Pricing Model	10.80%
Risk Premium Model	11.00%
Projected ROEs	10.5-14.0%
Recommended Common Equity Cost Rate	10.75%

**Q. BEFORE COMMENTING ON MR. WALKER'S SPECIFIC METHODOLOGIES AND RECOMMENDATIONS, DO YOU HAVE ANY GENERAL COMMENTS AND RESPONSES TO HIS CONCLUSIONS?**

A. Yes, I do. It is apparent that Mr. Walker's conclusions and recommendations are well beyond the mainstream of authorized ROE's for water utilities throughout the U.S. in recent years.

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<sup>26</sup> Direct Testimony of Harold Walker, page 3, lines 7-16.

**Q. DO YOU HAVE ANY DISAGREEMENTS WITH ANY OR ALL OF MR. WALKER'S METHODOLOGIES AND RECOMMENDATIONS?**

**A.** Yes. I have disagreements with each of his cost of equity methodologies and conclusions, as well as his proposed size adjustment included in his recommendations.

**Q. PLEASE BEGIN WITH HIS DCF MODEL AND CONCLUSIONS BY SUMMARIZING YOUR UNDERSTANDING OF MR. WALKER'S DCF ANALYSIS.**

**A.** Mr. Walker performs DCF analyses for his group of seven water utilities. His results are as follows:

	<u>Water Group</u>
Yield	2.1%
Growth	7.6%
Market Value DCF	9.7%
Hamada Adjustment	0.8%
DCF Result	10.5%

**Q. WHICH COMPONENT OF MR. WALKER'S DCF ANALYSES DO YOU DISAGREE WITH?**

**A.** I disagree with two of the components of Mr. Walker's DCF analyses. These are his proposed 7.6 percent growth rate and his 0.80 percent "leverage" (*i.e.*, Hamada adjustment).

**Q. WHAT COMMENTS DO YOU HAVE CONCERNING MR. WALKER'S GROWTH RATE RECOMMENDATION?**

**A.** Mr. Walker recommends a 7.6 percent growth rate for his water group. This conclusion substantially exceeds investor expectations and is not even supported by Mr. Walker's analyses. As is indicated on Mr. Walker's Schedule 13, most of the historic and

1 projected growth rates of EPS, DPS, and cash flow per share (CFPS) are dominated by one  
2 company (SJW Corp), which is currently involved in an major merger with another utility  
3 (Connecticut Water) and consequently does not meet Mr. Walker's own proxy group  
4 selection criteria.<sup>27</sup> Of the four historic growth rates he examined, none are as high as 7.6  
5 percent when SJW is excluded. In addition, of the eight projected growth rates he  
6 considered only two are as high as 7.6 percent (excluding SJW). Mr. Walker's  
7 recommendation for 7.6 percent growth rate can thus only be derived by relying on a proxy  
8 group member that does not meet his own selection criteria.

9 **Q. DO YOU HAVE ANY COMMENTS CONCERNING MR. WALKER'S**  
10 **PROPOSED LEVERAGE ADJUSTMENT?**

11 **A.** Yes. Mr. Walker is proposing a "leverage adjustment," which is essentially an  
12 adjustment to the DCF cost rate to offset Mr. Walker's concern that the divergence of stock  
13 prices from book values creates a conflict when the results of a market-derived cost of  
14 equity are applied to the common equity ratio measured at book value. Mr. Walker further  
15 claims that the existence of utility stock prices above book value creates greater financial  
16 risk for a book value capital structure versus a market value capital structure since the book  
17 value capital structure has a lower common equity ratio than the market value capital  
18 structure. As a result, Mr. Walker claims that because the rate setting process utilizes the  
19 book value capitalization, when computing the weighted average cost of capital, it is  
20 necessary to adjust the market-determined return on equity for the higher financial risk  
21 related to the book value of the capitalization.<sup>28</sup> Mr. Walker employs a formula (*i.e.*,  
22 Hamada formula) to quantify the differential between the book value and market value

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<sup>27</sup> Direct Testimony of Harold Walker, page 11, lines 1-2.

<sup>28</sup> Direct Testimony of Harold Walker, pages 39-43.



capital structure and concludes a 0.80 percent upward adjustment to the DCF cost ROE is warranted.<sup>29</sup>

I strongly disagree with Mr. Walker's proposed adjustment. Investors are well aware that water utilities' rates are established based upon the book value of their assets (rate base) and capitalization. As a result, investors are not expecting a regulatory award on any other basis, nor should they be compensated for any difference between the book value and market value of their common equity.

**Q. HOW ARE MR. WALKER'S CAPM ANALYSES PERFORMED?**

**A.** Mr. Walker proposes two sets of CAPM analyses, as shown below:

$$R_f + \beta(R_m - R_f) + size = K$$

$$\text{Historic} \quad 3.4\% + 0.71 \times 6.9\% + 0.90 = 9.2\%$$

$$\text{Projected} \quad 3.4\% + 0.71 \times 9.0\% + 0.90\% = 10.7\%$$

**Q. DO YOU AGREE WITH MR. WALKER'S 3.4 PERCENT RISK-FREE RATE?**

**A.** No, I do not. Current yields on long-term U.S. Treasury bonds are well below 3.4 percent, and in fact are below 3.0 percent. In addition, Mr. Walker improperly uses prospective interest rates, rather than current, actual interest rates, as one of the risk-free rates.

**Q. DO YOU AGREE WITH MR. WALKER'S VALUES FOR THE MARKET RISK PREMIUM COMPONENT OF HIS CAPM ANALYSES?**

**A.** No, I do not. Mr. Walker proposes a 6.9 percent historic risk premium and a 9.0 percent projected risk premium. He provides no justification as to why investors would

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<sup>29</sup> Direct Testimony of Harold Walker, page 43, lines 12-14.

1 expect the risk premium of stocks over bonds to income for 6.9 percent on a historic basis  
2 to 9.0 percent on a projected basis.

3 **Q. YOU INDICATE THAT MR. WALKER'S CAPM ANALYSES USE**  
4 **FORECASTED YIELDS ON U.S. TREASURY BONDS. WHY DO YOU**  
5 **DISAGREE WITH THIS?**

6 **A.** It is proper to use the current yield, rather than a projected yield, as the risk-free  
7 rate in a risk premium and CAPM context. This is the case since the current yield is known  
8 and measurable and reflects investors' collective assessment of all relevant capital market  
9 conditions. Prospective interest rates, in contrast, are not measurable and not achievable.  
10 For example, if the current yield on long-term Treasury bonds is 3.4 percent, this reflects  
11 the rate that investors can actually receive on their investment. Investors cannot receive a  
12 prospective yield on their investments since such a yield is not actual but rather speculative.  
13 I further note that Mr. Walker used actual bond yields, not projected yields, to derive his  
14 respective risk premiums. He is thus inconsistent in combining these risk premiums with  
15 projected bond yields.

16 **Q. DO YOU AGREE WITH THE PROPOSITION THAT PWR SHOULD BE**  
17 **ENTITLED TO A SIZE OR CREDIT RISK ADJUSTMENT?**

18 **A.** No, I do not. PWR's ratepayers should not be charged wastewater rates which  
19 reflect an incremental return to reflect the size of the Company. Such an increment is not  
20 justified and not appropriate, especially because PWR is a subsidiary of a larger company,  
21 and PWR does not raise capital on its own but does so instead through the consolidated  
22 entity.

**Q. IS IT PROPER TO COMPARE THE SIZE OF PWR TO THE WATER PROXY COMPANIES AND MAKE RISK COMPARISONS BASED UPON THE SIZE DIFFERENTIALS BETWEEN THEM?**

**A.** No, it is not proper. Many of the proxy water utilities have multiple subsidiaries that operate in different jurisdictions. Following Mr. Walker's reasoning, each of the subsidiaries of the proxy water utilities should be considered as riskier than the proxy group since, by definition, they would have to be smaller. This reasoning is flawed, since these individual water company subsidiaries do not raise their equity capital directly from investors, but rather do so as a consolidated entity.

**Q. ARE THERE OTHER REASONS WHY A SIZE ADJUSTMENT IS IMPROPER?**

**A.** Yes. There are other compelling reasons why a small size adjustment is not proper for regulated utilities. Proposals for size adjustments are frequently based upon reference to the Duff & Phelps (formerly Morningstar/Ibbotson) studies. However, the small size adjustment in the Duff & Phelps studies is based on the analysis of all stocks, the majority of which are unregulated and include industries that are much riskier than utilities. While it may or may not be true that, on an overall market basis, smaller publicly-traded firms exhibit more risk than larger firms, these smaller companies' stocks tend to be engaged in riskier businesses as a whole than do larger businesses. Such is not the case for regulated utilities.

Indeed, an academic study conducted by Professor Annie Wong found that:

“utility and industrial stocks do not share the same characteristics. First, given firm size, utility stocks are consistently less risky than industrial stocks. Second, industrial betas tend to decrease with firm size but utility betas do not. These findings may be attributed to the fact that all public utilities operate in an environment with regional monopolistic power than regulated financial structure. As a result,

the business and financial risk are very similar among the utilities regardless of their sizes. Therefore, utility betas would not necessarily be expected to be related to firm size.

...

This implies that although the price phenomenon has been strongly documented for the industrials, the **findings suggest that there is no need to adjust for the firm size in utility rate regulation.**<sup>30</sup>  
[emphasis added]

**Q. CAN YOU PROVIDE ANY DIRECT COMPARISONS OF WATER UTILITIES THAT DEMONSTRATES THAT SMALLER UTILITIES ARE NOT MORE RISKY THAN LARGER ONES?**

**A.** Yes. Implicit in Mr. Walker's proposal is an assumption that any perceived small size risk adjustment for unregulated companies applies to regulated public utilities. Schedule 12 of Exhibit DCP-2 demonstrates objectively that this is not the case. As this Schedule shows, there is no significant difference and no discernible pattern of increase among the risk indicators of publicly-traded water utilities of different sizes.

In addition, Schedule 13 demonstrates that this is not the case for the broader group of electric utilities. As this schedule shows, there is no significant difference among the risk indicators of publicly-traded electric utilities of different sizes.<sup>31</sup> The table below summarizes the information contained in this schedule:

Cap Size	Safety	Beta	Financial Strength	S&P Rank	S&P Rating	Moody's Rating
Under \$5 B	2.0	.66	B++/A	B+/A-	BBB+	Baa1
\$5 - \$15 B	2.3	.68	B++	B+/A-	BBB+/A-	Baa1
\$15 - \$25 B	1.8	.58	B++/A	B+	BBB+/A-	Baa2/Baa1
\$25 B Plus	1.8	.61	A	B+	BBB+/A-	Baa1

<sup>30</sup> Wong, Annie, "Utility Stocks and the Size Effect: An Empirical Analysis," Journal of the Midwest Finance Association, 1993, pp. 95-101.

<sup>31</sup> I utilize electric utilities for comparison purposes since there are more publicly-traded electric utilities than water utilities.

The safety rank beta values, financial strength and S&P stock rankings are about the same for all sizes of electric utilities. These risk indicators do not reflect any risk differential as the size of the electric utilities decrease from large to small. To the contrary, this data indicates that regulated monopoly utility providers have approximately the same risk regardless of size. As a result, the logic Mr. Walker uses to justify his proposed small size adjustment is not justified.

**Q. PLEASE NOW TURN TO MR. WALKER'S RISK PREMIUM METHODOLOGY AND CONCLUSIONS. WHAT IS YOUR UNDERSTANDING OF HIS USE OF THIS METHODOLOGY?**

**A.** Mr. Walker's risk premium methodology can be summarized as follows:<sup>32</sup>

Projected yield on A-rated debt	4.6%
Risk Premium	5.7%
	<hr/>
	10.3%
Hamada Adjustment	0.8%
	<hr/>
	11.1%

As was the case for his risk-free rate in the CAPM, Mr. Walker improperly uses projected yields on debt, rather than the more appropriate use of actual yields.

**Q. PLEASE COMMENT ON MR. WALKER'S RISK PREMIUM.**

**A.** Mr. Walker's 5.1 percent risk premium ( $R_m - R_f$ ) was developed from two types of analyses. First, he estimates the total market forecast return for the 1,700 stocks followed by Value Line (10.8 percent to 3.8 percent) in comparison to his forecast of A-rated industrial bonds (4.30 percent to 4.58 percent). The difference in these two numbers is 7.2 percent. He also computes the 1928-2017 risk premium based upon the Ibbotson Associates total return (4.9 percent).

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<sup>32</sup> Direct Testimony of Harold Walker, page 52, lines 10-16.

1 If the expected return of the 1,700 Value Line stocks and S&P 500 is indeed 10.8  
2 percent or greater, then it is improper to maintain that a less risky company (as shown  
3 earlier in my testimony), such as PWR, should have the same ROE. Yet, this is what Mr.  
4 Walker assumes.

5 Mr. Walker's second risk premium estimate, 4.05 percent from Ibbotson associates  
6 for the period 1928-2017, has the same problem I described earlier in connection with Mr.  
7 Walker's risk premium component in his CAPM analysis.

8 **Q. MR. WALKER ALSO CITES THE PROJECTED RETURNS ON EQUITY FOR**  
9 **HIS WATER GROUP AS AN INDICATOR OF THE COST OF EQUITY FOR**  
10 **PWR. DO YOU AGREE WITH THIS?**

11 **A.** No, I do not agree with this assertion. What Mr. Walker's analyses do not reflect  
12 is the fact that his water company sample has a current M/B of over 300 percent. Given  
13 that water utilities are regulated based upon the book value of their rate base and capital, it  
14 is clear that M/B of over 300 percent reflects a situation where the projected ROEs exceed  
15 the required cost of equity. Mr. Walker does not recognize this in his analyses.

16 **Q. WILL YOU UPDATE YOUR TESTIMONY BASED ON INFORMATION THAT**  
17 **BECOMES AVAILABLE?**

18 **A.** Yes. I fully reserve the right to revise my recommendations via supplemental  
19 testimony should new information not previously provided by the Company, or other  
20 sources, become available.

21 **Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

22 **A.** Yes, it does.

**BACKGROUND AND EXPERIENCE PROFILE**  
**DAVID C. PARCELL, MBA, CRRA**  
**PRESIDENT/SENIOR ECONOMIST**

**EDUCATION**

1985	M.B.A., Virginia Commonwealth University
1970	M.A., Economics, Virginia Polytechnic Institute and State University, (Virginia Tech)
1969	B.A., Economics, Virginia Polytechnic Institute and State University, (Virginia Tech)

**POSITIONS**

Present	Principal, Technical Associates, Inc.
2007-2016	President, Technical Associates, Inc.
1995-2007	Executive Vice President and Senior Economist, Technical Associates, Inc.
1993-1995	Vice President and Senior Economist, C. W. Amos of Virginia
1972-1993	Vice President and Senior Economist, Technical Associates, Inc.
1969-1972	Research Economist, Technical Associates, Inc.
1968-1969	Research Associate, Department of Economics, Virginia Polytechnic Institute and State University

**ACADEMIC HONORS**

Omicron Delta Epsilon - Honor Society in Economics  
Beta Gamma Sigma - National Scholastic Honor Society of Business Administration  
Alpha Iota Delta - National Decision Sciences Honorary Society  
Phi Kappa Phi - Scholastic Honor Society

**PROFESSIONAL DESIGNATIONS**

Certified Rate of Return Analyst - Founding Member

**RELEVANT EXPERIENCE**

Financial Economics -- Advised and assisted many Virginia banks and savings and loan associations on organizational and regulatory matters. Testified approximately 25 times before the Virginia State Corporation Commission and the Regional Administrator of National Banks on matters related to branching and organization for banks, savings and loan associations, and consumer finance companies. Advised financial institutions on interest rate structure and loan maturity. Testified before Virginia State Corporation Commission on maximum rates for consumer finance companies.

**Exhibit DCP-1**  
**Page 2 of 6**

Testified before several committees and subcommittees of Virginia General Assembly on numerous banking matters.

Clients have included First National Bank of Rocky Mount, Patrick Henry National Bank, Peoples Bank of Danville, Blue Ridge Bank, Bank of Essex, and Signet Bank.

Published articles in law reviews and other periodicals on structure and regulation of banking/financial services industry.

Utility Economics -- Performed numerous financial studies of regulated public utilities. Testified in over 550 cases before some fifty state and federal regulatory agencies.

Prepared numerous rate of return studies incorporating cost of equity determination based on DCF, CAPM, comparable earnings and other models. Developed procedures for identifying differential risk characteristics by nuclear construction and other factors.

Conducted studies with respect to cost of service and indexing for determining utility rates, the development of annual review procedures for regulatory control of utilities, fuel and power plant cost recovery adjustment clauses, power supply agreements among affiliates, utility franchise fees, and use of short-term debt in capital structure.

Presented expert testimony before federal regulatory agencies Federal Energy Regulatory Commission, Federal Power Commission, and National Energy Board (Canada), state regulatory agencies in Alabama, Alaska, Arizona, Arkansas, California, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Kansas, Kentucky, Maine, Maryland, Mississippi, Missouri, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, North Carolina, Ohio, Oklahoma, Ontario (Canada), Pennsylvania, South Carolina, Texas, Utah, Vermont, Virginia, West Virginia, Washington, Wisconsin, U.S. Virgin Islands, and Yukon Territory (Canada).

Published articles in law reviews and other periodicals on the theory and purpose of regulation and other regulatory subjects.

Clients served include state regulatory agencies in Alaska, Arizona, Delaware, Georgia, Mississippi, Missouri, New Hampshire, North Carolina, Ontario (Canada), South Carolina, U.S. Virgin Islands, Virginia and Washington; consumer advocates and attorneys general in Alabama, Arizona, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Kansas, Kentucky, Maryland, Nevada, New Jersey, New Mexico, Ohio, Oklahoma, Pennsylvania, South Carolina, Texas, Utah, Vermont, Virginia, and West Virginia; federal agencies including Defense Communications Agency, the Department of Energy, Department of the Navy, and General Services Administration; and various organizations such as Bath Iron Works, Illinois Citizens' Utility Board, Illinois Governor's Office of Consumer Services, Illinois Small Business Utility Advocate, Wisconsin's Environmental Decade, Wisconsin's Citizens Utility Board, Old Dominion Electric Cooperative, and industrial customers.



**Exhibit DCP-1**  
**Page 3 of 6**

Insurance Economics -- Conducted analyses of the relationship between the investment income earned by insurance companies on their portfolios and the premiums charged for insurance. Analyzed impact of diversification on financial strength of Blue Cross/Blue Shield Plans in Virginia.

Conducted studies of profitability and cost of capital for property/casualty insurance industry. Evaluated risk of and required return on surplus for various lines of insurance business.

Presented expert testimony before Virginia State Corporation Commission concerning cost of capital and expected gains from investment portfolio. Testified before insurance bureaus of Maine, Massachusetts, New Jersey, North Carolina, Rhode Island, South Carolina and Vermont concerning cost of equity for insurance companies.

Prepared cost of capital and investment income return analyses for numerous insurance companies concerning several lines of insurance business. Analyses used by Virginia Bureau of Insurance for purposes of setting rates.

Special Studies -- Conducted analyses which evaluated the financial and economic implications of legislative and administrative changes. Subject matter of analyses include returnable bottles, retail beer sales, wine sales regulations, taxi-cab taxation, and bank regulation. Testified before several Virginia General Assembly subcommittees.

Testified before Virginia ABC Commission concerning economic impact of mixed beverage license.

Clients include Virginia Beer Wholesalers, Wine Institute, Virginia Retail Merchants Association, and Virginia Taxicab Association.

Franchise, Merger & Anti-Trust Economics -- Conducted studies on competitive impact on market structures due to joint ventures, mergers, franchising and other business restructuring. Analyzed the costs and benefits to parties involved in mergers. Testified in federal courts and before banking and other regulatory bodies concerning the structure and performance of markets, as well as on the impact of restrictive practices.

Clients served include Dominion Bankshares, asphalt contractors, and law firms.

Transportation Economics -- Conducted cost of capital studies to assess profitability of oil pipelines, trucks, taxicabs and railroads. Analyses have been presented before the Federal Energy Regulatory Commission and Alaska Pipeline Commission in rate proceedings. Served as a consultant to the Rail Services Planning Office on the reorganization of rail services in the U.S.

Economic Loss Analyses -- Testified in federal courts, state courts, and other adjudicative forums regarding the economic loss sustained through personal and business injury whether due to bodily harm, discrimination, non-performance, or anticompetitive practices. Testified on economic loss

to a commercial bank resulting from publication of adverse information concerning solvency. Testimony has been presented on behalf of private individuals and business firms.

## MEMBERSHIPS

American Economic Association  
 Virginia Association of Economists  
 Richmond Society of Financial Analysts  
 Financial Analysts Federation  
 Society of Utility and Regulatory Financial Analysts  
     Board of Directors      1992-2000  
     Secretary/Treasurer    1994-1998  
     President                1998-2000

## RESEARCH ACTIVITY

### Books and Major Research Reports

"Stock Price As An Indicator of Performance," Master of Arts Thesis, Virginia Tech, 1970.

"Revision of the Property and Casualty Insurance Ratemaking Process Under Prior Approval in the Commonwealth of Virginia," prepared for the Bureau of Insurance of the Virginia State Corporation Commission, with Charles Schotta and Michael J. Ileo, 1971.

"An analysis of the Virginia Consumer Finance Industry to Determine the Need for Restructuring the Rate and Size Ceilings on Small Loans in Virginia and the Process by which They are Governed," prepared for the Virginia Consumer Finance Association, with Michael J. Ileo, 1973.

State Banks and the State Corporation Commission: A Historical Review, Technical Associates, Inc., 1974.

"A Study of the Implications of the Sale of Wine by the Virginia Department of Alcoholic Beverage Control", prepared for the Virginia Wine Wholesalers Association, Virginia Retail Merchants Association, Virginia Food Dealers Association, Virginia Association of Chain Drugstores, Southland Corporation, and the Wine Institute, 1983.

"Performance and Diversification of the Blue Cross/Blue Shield Plans in Virginia: An Operational Review", prepared for the Bureau of Insurance of the Virginia State Corporation Commission, with Michael J. Ileo and Alexander F. Skirpan, 1988.

The Cost of Capital - A Practitioners' Guide, Society of Utility and Regulatory Financial Analysts, 2010 (previous editions in 1991, 1992, 1993, 1994, 1995 and 1997).

**Papers Presented and Articles Published**

"The Differential Effect of Bank Structure on the Transmission of Open Market Operations," Western Economic Association Meeting, with Charles Schotta, 1971.

"The Economic Objectives of Regulation: The Trend in Virginia," (with Michael J. Ileo), William and Mary Law Review, Vol. 14, No. 2, 1973.

"Evolution of the Virginia Banking Structure, 1962-1974: The Effects of the Buck-Holland Bill", (with Michael J. Ileo), William and Mary Law Review, Vol. 16, No. 3, 1975.

"Banking Structure and Statewide Branching: The Potential for Virginia", William and Mary Law Review, Vol. 18, No. 1, 1976.

"Bank Expansion and Electronic Banking: Virginia Banking Structure Changes Past, Present, and Future," William and Mary Business Review, Vol. 1, No. 2, 1976.

"Electronic Banking - Wave of the Future?" (with James R. Marchand), Journal of Management and Business Consulting, Vol. 1, No. 1, 1976.

"The Pricing of Electricity" (with James R. Marchand), Journal of Management and Business Consulting, Vol. 1, No. 2, 1976.

"The Public Interest - Bank and Savings and Loan Expansion in Virginia" (with Richard D. Rogers), University of Richmond Law Review, Vol. 11, No. 3, 1977.

"When Is It In the 'Public Interest' to Authorize a New Bank?", University of Richmond Law Review, Vol. 13, No. 3, 1979.

"Banking Deregulation and Its Implications on the Virginia Banking Structure," William and Mary Business Review, Vol. 5, No. 1, 1983.

"The Impact of Reciprocal Interstate Banking Statutes on The Performance of Virginia Bank Stocks", with William B. Harrison, Virginia Social Science Journal, Vol. 23, 1988.

"The Financial Performance of New Banks in Virginia", Virginia Social Science Journal, Vol. 24, 1989.

"Identifying and Managing Community Bank Performance After Deregulation", with William B. Harrison, Journal of Managerial Issues, Vol. II, No. 2, Summer 1990.

"The Flotation Cost Adjustment To Utility Cost of Common Equity - Theory, Measurement and Implementation," presented at Twenty-Fifth Financial Forum, National Society of Rate of Return Analysts, Philadelphia, Pennsylvania, April 28, 1993.

Biography of Myon Edison Bristow, Dictionary of Virginia Biography, Volume 2, 2001.

## PALMETTO WASTEWATER RECLAMATION, LLC TOTAL COST OF CAPITAL

Capital Item	Percent 1/	Cost Rate			Weighted Cost		
Long-Term Debt	45.0%	5.04%	2/		2.27%		
Common Equity	55.0%	9.20%	<b>9.60%</b>	10.00%	5.06%	5.28%	5.50%
Total Capital	100.0%				7.33%		7.77%
					<b>7.55%</b>		
					(midpoint with 9.6% ROE)		

1/ Capital Structure ratios recommended by ORS.

2/ Cost of long-term debt proposed by PWR.

## ECONOMIC INDICATORS

Period	Real GDP *	Industrial Production Growth	Unemploy- ment Rate	Consumer Price Index
<b>1975 - 1982 Cycle</b>				
1975	-0.2%	-8.9%	8.5%	7.0%
1976	5.4%	7.9%	7.7%	4.8%
1977	4.6%	7.6%	7.1%	6.8%
1978	5.6%	5.5%	6.1%	9.0%
1979	3.2%	3.0%	5.8%	13.3%
1980	-0.2%	-2.6%	7.1%	12.4%
1981	2.6%	1.3%	7.6%	8.9%
1982	-1.9%	-5.2%	9.7%	3.8%
<b>1983 - 1991 Cycle</b>				
1983	4.6%	2.7%	9.6%	3.8%
1984	7.3%	8.9%	7.5%	3.9%
1985	4.2%	1.2%	7.2%	3.8%
1986	3.5%	1.0%	7.0%	1.1%
1987	3.5%	5.2%	6.2%	4.4%
1988	4.2%	5.2%	5.5%	4.4%
1989	3.7%	0.9%	5.3%	4.6%
1990	1.9%	1.0%	5.6%	6.1%
1991	-0.1%	-1.5%	6.8%	3.1%
<b>1992 - 2001 Cycle</b>				
1992	3.6%	2.9%	7.5%	2.9%
1993	2.7%	3.3%	6.9%	2.7%
1994	4.0%	5.2%	6.1%	2.7%
1995	2.7%	4.7%	5.6%	2.5%
1996	3.8%	4.5%	5.4%	3.3%
1997	4.5%	7.2%	4.9%	1.7%
1998	4.5%	5.8%	4.5%	1.6%
1999	4.7%	4.4%	4.2%	2.7%
2000	4.1%	3.9%	4.0%	3.4%
2001	1.0%	-3.1%	4.7%	1.6%
<b>2002 - 2009</b>				
2002	1.8%	0.3%	5.8%	2.4%
2003	2.8%	1.2%	6.0%	1.9%
2004	3.8%	2.6%	5.5%	3.3%
2005	3.3%	3.3%	5.1%	3.4%
2006	2.7%	2.2%	4.6%	2.5%
2007	1.8%	2.5%	4.6%	4.1%
2008	-0.1%	-3.5%	5.8%	0.1%
2009	-2.5%	-11.5%	9.3%	2.7%
<b>Current Cycle</b>				
2010	2.6%	5.5%	9.6%	1.5%
2011	1.6%	3.1%	8.9%	3.0%
2012	2.2%	3.0%	8.1%	1.7%
2013	1.8%	2.0%	7.4%	1.5%
2014	2.5%	3.1%	6.2%	0.8%
2015	2.9%	-1.0%	5.3%	0.7%
2016	1.6%	-1.9%	4.9%	2.1%
2017	2.2%	1.6%	4.4%	2.1%
2018		4.1%	3.9%	1.9%

\* GDP = Gross Domestic Product.

Note that certain series of data are periodically revised.

Sources: Council of Economic Advisers, Economic Indicators, various issues, certain earlier year data from sources used by this publication.

INTEREST RATES

Period	Prime Rate	U.S. Treasury T Bills 3 Months	U.S. Treasury T Bonds 10 Year	Utility Bonds Aa	Utility Bonds A	Utility Bonds Baa
<b>1975 - 1982 Cycle</b>						
1975	7.86%	5.84%	7.99%	9.44%	10.09%	10.96%
1976	6.84%	4.99%	7.61%	8.92%	9.29%	9.82%
1977	6.83%	5.27%	7.42%	8.43%	8.61%	9.06%
1978	9.06%	7.22%	8.41%	9.10%	9.29%	9.62%
1979	12.67%	10.04%	9.44%	10.22%	10.49%	10.96%
1980	15.27%	11.51%	11.46%	13.00%	13.34%	13.95%
1981	18.89%	14.03%	13.93%	15.30%	15.95%	16.60%
1982	14.86%	10.69%	13.00%	14.79%	15.86%	16.45%
<b>1983 - 1991 Cycle</b>						
1983	10.79%	8.63%	11.10%	12.83%	13.66%	14.20%
1984	12.04%	9.58%	12.44%	13.66%	14.03%	14.53%
1985	9.93%	7.48%	10.62%	12.06%	12.47%	12.96%
1986	8.33%	5.98%	7.68%	9.30%	9.58%	10.00%
1987	8.21%	5.82%	8.39%	9.77%	10.10%	10.53%
1988	9.32%	6.69%	8.85%	10.26%	10.49%	11.00%
1989	10.87%	8.12%	8.49%	9.56%	9.77%	9.97%
1990	10.01%	7.51%	8.55%	9.65%	9.86%	10.06%
1991	8.46%	5.42%	7.86%	9.09%	9.36%	9.55%
<b>1992 - 2001 Cycle</b>						
1992	6.25%	3.45%	7.01%	8.55%	8.69%	8.86%
1993	6.00%	3.02%	5.87%	7.44%	7.59%	7.91%
1994	7.15%	4.29%	7.09%	8.21%	8.31%	8.63%
1995	8.83%	5.51%	6.57%	7.77%	7.89%	8.29%
1996	8.27%	5.02%	6.44%	7.57%	7.75%	8.16%
1997	8.44%	5.07%	6.35%	7.54%	7.60%	7.95%
1998	8.35%	4.81%	5.26%	6.91%	7.04%	7.26%
1999	8.00%	4.66%	5.65%	7.51%	7.62%	7.88%
2000	9.23%	5.85%	6.03%	8.06%	8.24%	8.36%
2001	6.91%	3.44%	5.02%	7.59%	7.78%	8.02%
<b>2002 - 2009</b>						
2002	4.67%	1.62%	4.61%	7.19%	7.37%	8.02%
2003	4.12%	1.02%	4.01%	6.40%	6.58%	6.84%
2004	4.34%	1.38%	4.27%	6.04%	6.16%	6.40%
2005	6.19%	3.16%	4.29%	5.44%	5.65%	5.93%
2006	7.96%	4.73%	4.80%	5.84%	6.07%	6.32%
2007	8.05%	4.41%	4.63%	5.94%	6.07%	6.33%
2008	5.09%	1.48%	3.66%	6.18%	6.53%	7.25%
2009	3.25%	0.16%	3.26%	5.75%	6.04%	7.06%
<b>Current Cycle</b>						
2010	3.25%	0.14%	3.22%	5.24%	5.46%	5.96%
2011	3.25%	0.06%	2.78%	4.78%	5.04%	5.57%
2012	3.25%	0.09%	1.80%	3.83%	4.13%	4.86%
2013	3.25%	0.06%	2.35%	4.24%	4.47%	4.98%
2014	3.25%	0.03%	2.54%	4.19%	4.28%	4.80%
2015	3.26%	0.06%	2.14%	4.00%	4.12%	5.03%
2016	3.51%	0.33%	1.84%	3.73%	3.93%	4.69%
2017	4.10%	0.94%	2.33%	3.82%	4.00%	4.38%
2018	4.91%	1.94%	2.91%	4.09%	4.25%	4.67%
2019						
Jan	5.50%			4.18%	4.35%	4.91%
Feb	5.50%			4.05%	4.25%	4.76%

Sources: Council of Economic Advisers, [Economic Indicators](#), various issues, Mergent Bond Record.

# STOCK PRICE INDICATORS

Period	S&P Composite	NASDAQ Composite	Dow Jones Industrials	S&P E/P
<b>1975 - 1982 Cycle</b>				
1975			802.49	9.15%
1976			974.92	8.90%
1977			894.63	10.79%
1978			820.23	12.03%
1979			844.40	13.46%
1980			891.41	12.86%
1981			932.92	11.96%
1982			844.36	11.60%
<b>1983 - 1991 Cycle</b>				
1983			1,190.34	8.03%
1984			1,178.48	10.02%
1985			1,328.23	8.12%
1986			1,792.76	6.09%
1987			2,275.99	5.48%
1988	265.79		2,060.82	8.01%
1989	322.84		2,508.91	7.42%
1990	334.59		2,678.94	6.47%
1991	376.18	491.69	2,929.33	4.79%
<b>1992 - 2001 Cycle</b>				
1992	415.74	599.26	3,284.29	4.22%
1993	451.41	715.16	3,522.06	4.46%
1994	460.33	751.65	3,793.77	5.83%
1995	541.64	925.19	4,493.76	6.09%
1996	670.83	1,164.96	5,742.89	5.24%
1997	872.72	1,469.49	7,441.15	4.57%
1998	1,085.50	1,794.91	8,625.52	3.46%
1999	1,327.33	2,728.15	10,464.88	3.17%
2000	1,427.22	2,783.67	10,734.90	3.63%
2001	1,194.18	2,035.00	10,189.13	2.95%
<b>2002 - 2009</b>				
2002	993.94	1,539.73	9,226.43	2.92%
2003	965.23	1,647.17	8,993.59	3.84%
2004	1,130.65	1,986.53	10,317.39	4.89%
2005	1,207.23	2,099.32	10,547.67	5.36%
2006	1,310.46	2,263.41	11,408.67	5.78%
2007	1,476.66	2,577.12	13,169.98	5.29%
2008	1,220.89	2,162.46	11,252.61	3.54%
2009	946.73	1,841.03	8,876.15	1.86%
<b>Current Cycle</b>				
2010	1,139.31	2,347.70	10,662.80	6.04%
2011	1,268.89	2,680.42	11,966.36	6.77%
2012	1,379.56	2,965.77	12,967.08	6.20%
2013	1,462.51	3,537.69	14,999.67	5.57%
2014	1,930.67	4,374.31	16,773.99	5.25%
2015	2,061.20	4,943.49	17,590.61	4.59%
2016	2,092.39	4,982.49	17,908.08	4.17%
2017	2,448.22	6,231.28	21,741.91	4.22%
2018	2,744.68	7,419.27	25,045.75	

Note: this source did not publish the S&P Composite prior to 1989 and the NASDAQ prior to 1991.

Sources: Council of Economic Advisers, [Economic Indicators](#), various issues.



# PALMETTO WASTEWATER RECLAMATION, LLC

## CAPITAL STRUCTURE RATIOS

### 2014 -2018

Year	Common Equity	Long-Term Debt 1/	Short-Term Debt 2/
<b>2014</b>	\$4,316,099 29.7% 31.4%	\$9,410,873 64.6% 68.6%	\$829,697 5.7%
<b>2015</b>	\$15,820,353 60.9% 62.2%	\$9,612,341 37.0% 37.8%	\$556,445 2.1%
<b>2016</b>	\$16,509,976 57.8% 59.2%	\$11,365,810 39.8% 40.8%	\$697,996 2.4%
<b>2017</b>	\$16,990,825 46.7% 47.6%	\$18,669,566 51.3% 52.4%	\$761,450 2.1%
<b>2018</b>	\$21,810,396 60.9% 62.2%	\$13,260,762 37.0% 37.8%	\$761,450 2.1%

1/ Long-term notes payable - BofA Revolver, long-term notes payable - BofA, advances from affiliates, and unamortized debt issuance costs.

2/ Current portion of long-term notes payable.

Source: Response to ORS Data Request #11.

**NI PACOLET MILLIKEN ENTERPRISES, INC.**  
**CAPITAL STRUCTURE RATIOS**  
**2016 - 2018**

<b>Year</b>	<b>Common Equity</b>	<b>Long-Term Debt</b>	<b>Short-Term Debt 1/</b>
<b>2016</b>	\$128,083,320 73.3% 74.9%	\$42,834,151 24.5% 25.1%	\$3,918,750 2.2%
<b>2017</b>	\$179,703,649 79.7% 81.2%	\$41,509,151 18.4% 18.8%	\$4,275,000 1.9%
<b>9/30/2018</b>	\$182,111,195 81.6% 83.2%	\$36,802,901 16.5% 16.8%	\$4,275,000 1.9%

1/ Current portion of long-term debt.

Source: Response to ORS Question 1-70.

**PROXY COMPANIES  
CAPITAL STRUCTURE RATIOS**

	2014	2015	2016	2017	2018	2014-2018 Average	2021-2023 Estimated
<b>Value Line Water Group</b>							
American States Water Co.	60.9%	58.9%	60.6%	62.0%	58.5%	60.2%	54.0%
American Water Works Co.	47.4%	46.2%	47.5%	45.3%	43.5%	46.0%	42.5%
Aqua America, Inc.	51.5%	49.7%	51.6%	49.4%	49.0%	50.2%	46.5%
California Water Service Group	59.9%	55.6%	55.4%	57.3%	51.0%	55.8%	62.5%
Connecticut Water Service, Inc.	54.1%	55.7%	54.4%	53.6%	53.5%	54.3%	55.0%
Middlesex Water Co.	58.8%	59.8%	61.5%	61.8%	63.5%	61.1%	62.5%
SJW Group	48.4%	50.2%	49.3%	51.8%	52.5%	50.4%	53.5%
York Water Co.	55.2%	55.6%	57.4%	57.0%	62.0%	57.4%	66.0%
<b>Mean</b>						<b>54.4%</b>	<b>55.3%</b>
<b>Median</b>						<b>55.1%</b>	<b>54.5%</b>
<b>Parcell Proxy Group</b>							
American States Water Co.	60.9%	58.9%	60.6%	62.0%	58.5%	60.2%	54.0%
American Water Works Co.	47.4%	46.2%	47.5%	45.3%	43.5%	46.0%	42.5%
California Water Service Group	59.9%	55.6%	55.4%	57.3%	51.0%	55.8%	62.5%
Middlesex Water Co.	58.8%	59.8%	61.5%	61.8%	63.5%	61.1%	62.5%
York Water Co.	55.2%	55.6%	57.4%	57.0%	62.0%	57.4%	66.0%
<b>Mean</b>						<b>56.1%</b>	<b>57.5%</b>
<b>Median</b>						<b>57.4%</b>	<b>62.5%</b>
<b>Walker Water Group</b>							
American States Water Co.	60.9%	58.9%	60.6%	62.0%	58.5%	60.2%	54.0%
American Water Works Co.	47.4%	46.2%	47.5%	45.3%	43.5%	46.0%	42.5%
Aqua America, Inc.	51.5%	49.7%	51.6%	49.4%	49.0%	50.2%	46.5%
California Water Service Group	59.9%	55.6%	55.4%	57.3%	51.0%	55.8%	62.5%
Middlesex Water Co.	58.8%	59.8%	61.5%	61.8%	63.5%	61.1%	62.5%
SJW Group	48.4%	50.2%	49.3%	51.8%	52.5%	50.4%	53.5%
York Water Co.	55.2%	55.6%	57.4%	57.0%	62.0%	57.4%	66.0%
<b>Mean</b>						<b>54.5%</b>	<b>55.4%</b>
<b>Median</b>						<b>55.8%</b>	<b>54.0%</b>

Source: Value Line Investment Survey.

PROXY COMPANIES  
CRITERIA FOR SELECTION

Company	Market Capitalization (\$000)	Common Equity Ratio	Value Line Safety	S&P Bond Rating 5/	Moody's Bond Rating 5/	Proxy Group Inclusion?
<b>Value Line Water Group 1/</b>						
American States Water Co.	\$2,500,000	58.5%	2	A+	NR	Yes
American Water Works Co.	\$16,400,000	43.5%	3	A	A3	Yes
Aqua America, Inc.	\$6,100,000	49.0%	2	A+	NR	No 2/
California Water Service Group	\$2,300,000	51.0%	3	A+	NR	Yes
Connecticut Water Service, Inc.	\$800,000	53.5%	3	A	NR	No 3/
Consolidated Water Co.	\$175,000	100.0%	3	NR	NR	No 4/
Middlesex Water Co.	\$875,000	63.5%	2	A	NR	Yes
SJW Group	\$1,100,000	52.5%	3	A	NR	No 3/
York Water Co.	\$425,000	62.0%	3	A-	NR	Yes
<b>Parcell Proxy Group</b>						
American States Water Co.	\$2,500,000	58.5%	2	A+	NR	
American Water Works Co.	\$16,400,000	43.5%	3	A	A3	
California Water Service Group	\$2,300,000	51.0%	3	A+	NR	
Middlesex Water Co.	\$875,000	63.5%	2	A	NR	
York Water Co.	\$425,000	62.0%	3	A-	NR	
<b>Walker Water Group</b>						
American States Water Co.	\$2,500,000	58.5%	2	A+	NR	
American Water Works Co.	\$16,400,000	43.5%	3	A	A3	
Aqua America, Inc.	\$6,100,000	49.0%	2	A+	NR	
California Water Service Group	\$2,300,000	51.0%	3	A+	NR	
Middlesex Water Co.	\$875,000	63.5%	2	A	NR	
SJW Group	\$1,100,000	52.5%	3	A	NR	
York Water Co.	\$425,000	62.0%	3	A-	NR	

1/ Companies considered are reported in Value Line, Standard Edition, and are listed as "Water Utility Industry."

2/ Aqua America not included in Parcell proxy group since this firm is currently involved in merger of Peoples Natural Gas Co., Peoples Gas, and Delta Natural Gas.

3/ Connecticut Water and SJW not included in Parcell proxy group since these two firms are currently actively engaged in merger activities with each other.

4/ Consolidated Water not included in Parcell proxy group since this Company operates primarily as a desalination provider of water in areas outside the U.S.

5/ Bond ratings are for Issuer Rating (Moody's) and Issuer Credit (Standard & Poor's) for companies that have these ratings, and highest other ratings for companies that do not have these ratings.

Sources: Value Line, S&P, Moody's.

**PROXY COMPANIES  
DIVIDEND YIELD CALCULATIONS**

Company	Quarterly DPS	Annual DPS	Stock Price (December 2018 - February 2019)			Yield
			High	Low	Average	
Value Line Water Group						
American States Water Co.	\$0.275	\$1.10	\$71.94	\$63.15	\$67.55	1.63%
American Water Works Co.	\$0.455	\$1.82	\$102.07	\$85.89	\$93.98	1.94%
Aqua America, Inc.	\$0.219	\$0.88	\$36.39	\$32.16	\$34.28	2.56%
California Water Service Group	\$0.198	\$0.79	\$52.98	\$43.38	\$48.18	1.64%
Connecticut Water Service, Inc.	\$0.313	\$1.25	\$69.80	\$62.80	\$66.30	1.89%
Middlesex Water Co.	\$0.240	\$0.96	\$60.31	\$49.17	\$54.74	1.75%
SJW Group	\$0.300	\$1.20	\$62.44	\$51.82	\$57.13	2.10%
York Water Co.	\$0.173	\$0.69	\$36.45	\$29.88	\$33.17	2.09%
Mean						1.95%
Parcell Proxy Group						
American States Water Co.	\$0.275	\$1.10	\$71.94	\$63.15	\$67.55	1.63%
American Water Works Co.	\$0.455	\$1.82	\$102.07	\$85.89	\$93.98	1.94%
California Water Service Group	\$0.198	\$0.79	\$52.98	\$43.38	\$48.18	1.64%
Middlesex Water Co.	\$0.240	\$0.96	\$60.31	\$49.17	\$54.74	1.75%
York Water Co.	\$0.173	\$0.69	\$36.45	\$29.88	\$33.17	2.09%
Mean						1.81%
Walker Water Group						
American States Water Co.	\$0.275	\$1.10	\$71.94	\$63.15	\$67.55	1.63%
American Water Works Co.	\$0.455	\$1.82	\$102.07	\$85.89	\$93.98	1.94%
Aqua America, Inc.	\$0.219	\$0.88	\$36.39	\$32.16	\$34.28	2.56%
California Water Service Group	\$0.198	\$0.79	\$52.98	\$43.38	\$48.18	1.64%
Middlesex Water Co.	\$0.240	\$0.96	\$60.31	\$49.17	\$54.74	1.75%
SJW Group	\$0.300	\$1.20	\$62.44	\$51.82	\$57.13	2.10%
York Water Co.	\$0.173	\$0.69	\$36.45	\$29.88	\$33.17	2.09%
Mean						1.96%

Source: Information contained in Yahoo! Finance.

PROXY COMPANIES  
RETENTION GROWTH RATES

Company	2014	2015	2016	2017	2018	2014-18 Average	2018	2015-17 to 2021-23	2018 - 2021-23 Average
<b>Value Line Water Group</b>									
American States Water Co.	5.7%	6.0%	5.3%	6.2%	5.5%	5.7%	5.5%	6.0%	5.8%
American Water Works Co.	4.3%	4.7%	4.0%	2.5%	4.5%	4.0%	4.5%	4.5%	4.5%
Aqua America, Inc.	6.1%	4.7%	5.6%	5.1%	5.0%	5.3%	5.0%	4.5%	4.8%
California Water Service Group	4.1%	2.0%	2.4%	4.7%	3.5%	3.3%	5.5%	5.5%	5.5%
Connecticut Water Service, Inc.	4.8%	4.9%	4.6%	3.5%	2.5%	4.1%	5.0%	5.0%	5.0%
Middlesex Water Co.	3.1%	3.5%	4.3%	3.8%	6.5%	4.2%	6.5%	6.5%	6.5%
SJW Group	10.2%	5.7%	8.6%	8.2%	5.0%	7.5%	6.5%	10.0%	8.3%
York Water Co.	3.9%	4.4%	3.4%	4.0%	3.5%	3.8%	4.0%	5.0%	4.5%
<b>Mean</b>						<b>4.8%</b>			<b>5.6%</b>
<b>Parcell Proxy Group</b>									
American States Water Co.	5.7%	6.0%	5.3%	6.2%	5.5%	5.7%	5.5%	6.0%	5.8%
American Water Works Co.	4.3%	4.7%	4.0%	2.5%	4.5%	4.0%	4.5%	4.5%	4.5%
California Water Service Group	4.1%	2.0%	2.4%	4.7%	3.5%	3.3%	5.5%	5.5%	5.5%
Middlesex Water Co.	3.1%	3.5%	4.3%	3.8%	6.5%	4.2%	6.5%	6.5%	6.5%
York Water Co.	3.9%	4.4%	3.4%	4.0%	3.5%	3.8%	4.0%	5.0%	4.5%
<b>Mean</b>						<b>4.2%</b>			<b>5.4%</b>
<b>Walker Water Group</b>									
American States Water Co.	5.7%	6.0%	5.3%	6.2%	5.5%	5.7%	5.5%	6.0%	5.8%
American Water Works Co.	4.3%	4.7%	4.0%	2.5%	4.5%	4.0%	4.5%	4.5%	4.5%
Aqua America, Inc.	6.1%	4.7%	5.6%	5.1%	5.0%	5.3%	5.0%	4.5%	4.8%
California Water Service Group	4.1%	2.0%	2.4%	4.7%	3.5%	3.3%	5.5%	5.5%	5.5%
Middlesex Water Co.	3.1%	3.5%	4.3%	3.8%	6.5%	4.2%	6.5%	6.5%	6.5%
SJW Group	10.2%	5.7%	8.6%	8.2%	5.0%	7.5%	6.5%	10.0%	8.3%
York Water Co.	3.9%	4.4%	3.4%	4.0%	3.5%	3.8%	4.0%	5.0%	4.5%
<b>Mean</b>						<b>4.9%</b>			<b>5.7%</b>

Figures reported by Value Line as "Retained to Com Eq."

Source: Value Line Investment Survey.

# **PROXY COMPANIES PER SHARE GROWTH RATES**

Company	Five-Year Historic Growth Rates				Est'd -15-'17 to '21-'23 Growth Rates			
	EPS	DPS	BVPS	Average	EPS	DPS	BVPS	Average
<b>Value Line Water Group</b>								
American States Water Co.	7.0%	10.5%	4.5%	7.3%	6.0%	8.0%	4.0%	6.0%
American Water Works Co.	7.5%	8.5%	4.0%	6.7%	10.0%	10.0%	6.0%	8.7%
Aqua America, Inc.	9.5%	8.0%	7.5%	8.3%	7.5%	9.0%	5.5%	7.3%
California Water Service Group	4.0%	2.5%	5.0%	3.8%	9.5%	6.5%	3.0%	6.3%
Connecticut Water Service, Inc.	10.5%	3.5%	6.5%	6.8%	5.5%	5.5%	3.5%	4.8%
Middlesex Water Co.	8.0%	2.0%	3.5%	4.5%	9.0%	5.5%	4.0%	6.2%
SJW Group	18.5%	5.0%	8.0%	10.5%	6.0%	8.5%	nmf	7.3%
York Water Co.	6.5%	3.5%	3.5%	4.5%	9.0%	8.0%	4.5%	7.2%
<b>Mean</b>				<b>6.6%</b>				<b>6.7%</b>
<b>Parcell Proxy Group</b>								
American States Water Co.	7.0%	10.5%	4.5%	7.3%	6.0%	8.0%	4.0%	6.0%
American Water Works Co.	7.5%	8.5%	4.0%	6.7%	10.0%	10.0%	6.0%	8.7%
California Water Service Group	4.0%	2.5%	5.0%	3.8%	9.5%	6.5%	3.0%	6.3%
Middlesex Water Co.	8.0%	2.0%	3.5%	4.5%	9.0%	5.5%	4.0%	6.2%
York Water Co.	6.5%	3.5%	3.5%	4.5%	9.0%	8.0%	4.5%	7.2%
<b>Mean</b>				<b>5.4%</b>				<b>6.9%</b>
<b>Walker Water Group</b>								
American States Water Co.	7.0%	10.5%	4.5%	7.3%	6.0%	8.0%	4.0%	6.0%
American Water Works Co.	7.5%	8.5%	4.0%	6.7%	10.0%	10.0%	6.0%	8.7%
Aqua America, Inc.	9.5%	8.0%	7.5%	8.3%	7.5%	9.0%	5.5%	7.3%
California Water Service Group	4.0%	2.5%	5.0%	3.8%	9.5%	6.5%	3.0%	6.3%
Middlesex Water Co.	8.0%	2.0%	3.5%	4.5%	9.0%	5.5%	4.0%	6.2%
SJW Group	18.5%	5.0%	8.0%	10.5%	6.0%	8.5%	nmf	7.3%
York Water Co.	6.5%	3.5%	3.5%	4.5%	9.0%	8.0%	4.5%	7.2%
<b>Mean</b>				<b>6.5%</b>				<b>7.0%</b>

Source: Value Line Investment Survey.

PROXY COMPANIES  
DCF COST RATES

Company	Adjusted Yield	Historic Retention Growth	Prospective Retention Growth	Historic Per Share Growth	Prospective Per Share Growth	First Call EPS Growth	Average Growth	DCF Rates
<b>Value Line Water Group</b>								
American States Water Co.	1.7%	5.7%	5.8%	7.3%	6.0%	6.00%	6.2%	7.8%
American Water Works Co.	2.0%	4.0%	4.5%	6.7%	8.7%	8.20%	6.4%	8.4%
Aqua America, Inc.	2.6%	5.3%	4.8%	8.3%	7.3%	5.00%	6.1%	8.8%
California Water Service Group	1.7%	3.3%	5.5%	3.8%	6.3%	9.80%	5.8%	7.4%
Connecticut Water Service, Inc.	1.9%	4.1%	5.0%	6.8%	4.8%	6.00%	5.3%	7.3%
Middlesex Water Co.	1.8%	4.2%	6.5%	4.5%	6.2%	2.70%	4.8%	6.6%
SJW Group	2.2%	7.5%	8.3%	10.5%	7.3%	14.00%	9.5%	11.7%
York Water Co.	2.1%	3.8%	4.5%	4.5%	7.2%	4.90%	5.0%	7.1%
<b>Mean</b>	2.0%	4.8%	5.6%	6.6%	6.7%	7.1%	6.1%	<b>8.2%</b>
<b>Median</b>	2.0%	4.2%	5.3%	6.8%	6.8%	6.0%	6.0%	<b>7.6%</b>
<b>Composite - Mean</b>		<b>6.8%</b>	7.6%	8.6%	8.7%	<b>9.1%</b>	8.2%	
<b>Composite - Median</b>		<b>6.1%</b>	7.2%	8.7%	<b>8.7%</b>	8.0%	7.9%	
<b>Parcell Proxy Group</b>								
American States Water Co.	1.7%	5.7%	5.8%	7.3%	6.0%	6.00%	6.2%	7.8%
American Water Works Co.	2.0%	4.0%	4.5%	6.7%	8.7%	8.20%	6.4%	8.4%
California Water Service Group	1.7%	3.3%	5.5%	3.8%	6.3%	9.80%	5.8%	7.4%
Middlesex Water Co.	1.8%	4.2%	6.5%	4.5%	6.2%	2.70%	4.8%	6.6%
York Water Co.	2.1%	3.8%	4.5%	4.5%	7.2%	4.90%	5.0%	7.1%
<b>Mean</b>	1.9%	4.2%	5.4%	5.4%	6.9%	6.3%	5.6%	<b>7.5%</b>
<b>Median</b>	1.8%	4.0%	5.5%	4.5%	6.3%	6.0%	5.8%	<b>7.4%</b>
<b>Composite - Mean</b>		<b>6.1%</b>	7.2%	7.2%	<b>8.7%</b>	8.2%	7.5%	
<b>Composite - Median</b>		<b>5.8%</b>	7.3%	<b>6.3%</b>	<b>8.1%</b>	7.8%	7.6%	
<b>Walker Water Group</b>								
American States Water Co.	1.7%	5.7%	5.8%	7.3%	6.0%	6.00%	6.2%	<b>7.8%</b>
American Water Works Co.	2.0%	4.0%	4.5%	6.7%	8.7%	8.20%	6.4%	<b>8.4%</b>
Aqua America, Inc.	2.6%	5.3%	4.8%	8.3%	7.3%	5.00%	6.1%	<b>8.8%</b>
California Water Service Group	1.7%	3.3%	5.5%	3.8%	6.3%	9.80%	5.8%	<b>7.4%</b>
Middlesex Water Co.	1.8%	4.2%	6.5%	4.5%	6.2%	2.70%	4.8%	<b>6.6%</b>
SJW Group	2.2%	7.5%	8.3%	10.5%	7.3%	14.00%	9.5%	<b>11.7%</b>
York Water Co.	2.1%	3.8%	4.5%	4.5%	7.2%	4.90%	5.0%	<b>7.1%</b>
<b>Mean</b>	2.0%	4.9%	5.7%	6.5%	7.0%	7.2%	6.3%	<b>8.3%</b>
<b>Median</b>	2.0%	4.2%	5.5%	6.7%	7.2%	6.0%	6.1%	<b>7.8%</b>
<b>Composite - Mean</b>		<b>6.9%</b>	7.7%	8.5%	9.0%	<b>9.2%</b>	8.3%	
<b>Composite - Median</b>		<b>6.2%</b>	7.5%	8.7%	<b>9.2%</b>	8.0%	8.1%	

Sources: previous pages of this schedule.



**STANDARD & POOR'S 500 COMPOSITE  
20-YEAR U.S. TREASURY BOND YIELDS  
RISK PREMIUMS**

Year	EPS	BVPS	ROE	20-Year T-Bond Yield	Risk Premium
1977		\$79.07			
1978	\$12.33	\$85.35	15.00%	7.90%	7.10%
1979	\$14.86	\$94.27	16.55%	8.86%	7.69%
1980	\$14.82	\$102.48	15.06%	9.97%	5.09%
1981	\$15.36	\$109.43	14.50%	11.55%	2.95%
1982	\$12.64	\$112.46	11.39%	13.50%	-2.11%
1983	\$14.03	\$116.93	12.23%	10.38%	1.85%
1984	\$16.64	\$122.47	13.90%	11.74%	2.16%
1985	\$14.61	\$125.20	11.80%	11.25%	0.55%
1986	\$14.48	\$126.82	11.49%	8.98%	2.51%
1987	\$17.50	\$134.07	13.42%	7.92%	5.50%
1988	\$23.75	\$141.32	17.25%	8.97%	8.28%
1989	\$22.87	\$147.26	15.85%	8.81%	7.04%
1990	\$21.73	\$153.01	14.47%	8.19%	6.28%
1991	\$16.29	\$158.85	10.45%	8.22%	2.23%
1992	\$18.86	\$149.74	12.22%	7.26%	4.96%
1993	\$21.89	\$180.88	13.24%	7.17%	6.07%
1994	\$30.60	\$193.06	16.37%	6.59%	9.78%
1995	\$33.96	\$216.51	16.58%	7.60%	8.98%
1996	\$38.73	\$237.08	17.08%	6.18%	10.90%
1997	\$39.72	\$249.52	16.33%	6.64%	9.69%
1998	\$37.71	\$266.40	14.62%	5.83%	8.79%
1999	\$48.17	\$290.68	17.29%	5.57%	11.72%
2000	\$50.00	\$325.80	16.22%	6.50%	9.72%
2001	\$24.70	\$338.37	7.44%	5.53%	1.91%
2002	\$27.59	\$321.72	8.36%	5.59%	2.77%
2003	\$48.73	\$367.17	14.15%	4.80%	9.35%
2004	\$58.55	\$414.75	14.98%	5.02%	9.96%
2005	\$69.93	\$453.06	16.12%	4.69%	11.43%
2006	\$81.51	\$504.39	17.03%	4.68%	12.35%
2007	\$66.17	\$529.59	12.80%	4.86%	7.94%
2008	\$14.88	\$451.37	3.03%	4.45%	-1.42%
2009	\$50.97	\$513.58	10.56%	3.47%	7.09%
2010	\$77.35	\$579.14	14.16%	4.25%	9.91%
2011	\$86.95	\$613.14	14.59%	3.82%	10.77%
2012	\$86.51	\$666.97	13.52%	2.46%	11.06%
2013	\$100.20	\$715.84	14.49%	2.88%	11.61%
2014	\$102.31	\$726.96	14.18%	3.41%	10.77%
2015	\$88.43	\$740.29	12.05%	2.47%	9.58%
2016	\$95.48	\$768.98	12.65%	2.30%	10.35%
2017	\$110.98	\$826.52	13.91%	2.67%	11.24%
<b>Mean</b>					<b>7.11%</b>

ROE = EPS divided by average of year-begin and year-end BVPS.

20-Year T-Bond Yield = income return on long-term U.S. Government Bonds.

Sources: Standard & Poor's, Duff & Phelps.

## PROXY COMPANIES CAPM COST RATES

Company	Risk-Free Rate	Beta	Risk Premium	CAPM Rates
<b>Value Line Water Group</b>				
American States Water Co.	2.91%	0.70	6.0%	7.1%
American Water Works Co.	2.91%	0.55	6.0%	6.2%
Aqua America, Inc.	2.91%	0.70	6.0%	7.1%
California Water Service Group	2.91%	0.70	6.0%	7.1%
Connecticut Water Service, Inc.	2.91%	0.60	6.0%	6.5%
Middlesex Water Co.	2.91%	0.75	6.0%	7.4%
SJW Group	2.91%	0.60	6.0%	6.5%
York Water Co.	2.91%	0.75	6.0%	7.4%
<b>Mean</b>				<b>6.9%</b>
<b>Median</b>				<b>7.1%</b>
<b>Parcell Proxy Group</b>				
American States Water Co.	2.91%	0.70	6.0%	7.1%
American Water Works Co.	2.91%	0.55	6.0%	6.2%
California Water Service Group	2.91%	0.70	6.0%	7.1%
Middlesex Water Co.	2.91%	0.75	6.0%	7.4%
York Water Co.	2.91%	0.75	6.0%	7.4%
<b>Mean</b>				<b>7.1%</b>
<b>Median</b>				<b>7.1%</b>
<b>Walker Water Group</b>				
American States Water Co.	2.91%	0.70	6.0%	7.1%
American Water Works Co.	2.91%	0.55	6.0%	6.2%
Aqua America, Inc.	2.91%	0.70	6.0%	7.1%
California Water Service Group	2.91%	0.70	6.0%	7.1%
Middlesex Water Co.	2.91%	0.75	6.0%	7.4%
SJW Group	2.91%	0.60	6.0%	6.5%
York Water Co.	2.91%	0.75	6.0%	7.4%
<b>Mean</b>				<b>7.0%</b>
<b>Median</b>				<b>7.1%</b>

Sources: Value Line Investment Survey, Standard & Poor's, Federal Reserve.

### Yields on 20-Year U.S. Treasury Bonds

Month	Rate
Dec 2018	2.98%
Jan 2019	2.89%
Feb 2019	2.87%
Average	2.91%

PROXY COMPANIES  
RATES OF RETURN ON AVERAGE COMMON EQUITY

Company	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Average	2009-18	2019	2021-23
<b>Value Line Water Group</b>																					
American States Water Co.	9.8%	5.6%	7.3%	8.6%	8.3%	9.5%	8.8%	8.7%	11.2%	10.7%	12.6%	13.2%	12.1%	12.4%	12.3%	13.4%	11.1%	8.3%	11.8%	13.0%	14.0%
American Water Works Co.	12.6%	11.9%	11.4%	11.7%	10.6%	10.0%	9.6%	5.1%	6.6%	7.2%	8.6%	8.0%	8.9%	9.5%	9.1%	8.0%	10.5%	8.2%	10.5%	10.5%	10.5%
Aqua America, Inc.	9.7%	8.9%	9.7%	9.4%	7.9%	8.2%	10.0%	9.7%	10.8%	11.8%	11.5%	14.0%	13.4%	12.0%	13.1%	12.6%	12.7%	11.1%	12.2%	13.0%	12.5%
California Water Service Group	11.6%	11.2%	10.8%	7.8%	7.0%	8.9%	9.2%	9.6%	8.8%	8.5%	8.9%	8.5%	10.4%	10.5%	10.1%	9.4%	7.3%	9.1%	8.7%	11.0%	11.5%
Connecticut Water Service, Inc.	10.1%	8.1%	9.3%	8.7%	9.2%	8.9%	8.9%	7.1%	8.9%	8.5%	7.9%	8.8%	9.4%	9.8%	10.6%	10.1%	13.0%	9.0%	9.3%	13.0%	13.0%
Middlesex Water Co.	9.4%	10.4%	9.1%	10.8%	10.3%	8.2%	8.0%	5.9%	6.1%	7.9%	8.2%	7.3%	15.1%	10.1%	13.0%	13.2%	9.9%	9.5%	9.1%	12.5%	17.5%
SJW Group	10.4%	11.8%	11.3%	11.8%	10.9%	9.7%	9.4%	9.8%	10.1%	9.7%	9.5%	9.5%	11.0%	11.6%	10.6%	11.1%	10.4%	10.8%	10.3%	10.5%	13.5%
York Water Co.																					
<b>Mean</b>	10.5%	9.7%	9.8%	9.8%	9.2%	9.1%	8.5%	8.2%	8.9%	8.9%	9.6%	9.7%	10.6%	10.4%	10.8%	11.0%	10.5%	9.6%	9.8%	11.7%	12.9%
<b>Median</b>	10.1%	10.4%	9.7%	9.4%	9.2%	8.9%	9.1%	9.2%	8.9%	8.3%	9.1%	8.7%	10.4%	10.3%	10.6%	10.6%	10.5%	9.5%	9.6%	11.8%	12.8%
<b>Parcell Proxy Group</b>																					
American States Water Co.	9.8%	5.6%	7.3%	8.6%	8.3%	9.5%	8.8%	8.7%	11.2%	10.7%	12.6%	13.2%	12.1%	12.4%	12.3%	13.4%	11.1%	8.3%	11.8%	13.0%	14.0%
American Water Works Co.	9.7%	8.9%	9.7%	9.4%	7.9%	8.2%	10.0%	9.9%	6.6%	7.2%	8.6%	8.0%	8.9%	9.5%	9.1%	8.0%	10.5%	8.2%	10.5%	10.5%	10.5%
California Water Service Group	10.1%	8.1%	9.3%	8.7%	9.2%	8.9%	8.9%	7.1%	8.9%	7.5%	7.9%	8.8%	9.4%	9.8%	10.6%	10.1%	13.0%	9.1%	8.7%	11.0%	11.5%
Middlesex Water Co.	10.4%	11.8%	11.3%	11.8%	10.9%	9.7%	9.4%	9.8%	10.1%	9.7%	9.5%	9.5%	11.0%	11.6%	10.6%	11.1%	10.4%	10.8%	10.3%	10.5%	13.5%
York Water Co.																					
<b>Mean</b>	10.0%	8.6%	9.4%	9.6%	9.1%	9.1%	8.2%	8.1%	9.1%	8.6%	9.6%	9.6%	10.1%	10.1%	10.0%	10.5%	10.8%	9.3%	9.7%	11.6%	12.5%
<b>Median</b>	10.0%	8.5%	9.5%	9.1%	8.8%	9.2%	8.9%	8.7%	8.9%	8.1%	9.3%	8.8%	9.4%	9.8%	10.6%	10.1%	10.5%	9.1%	9.4%	11.0%	13.0%
<b>Walker Water Group</b>																					
American States Water Co.	9.8%	5.6%	7.3%	8.6%	8.3%	9.5%	8.8%	8.7%	11.2%	10.7%	12.6%	13.2%	12.1%	12.4%	12.3%	13.4%	11.1%	8.3%	11.8%	13.0%	14.0%
American Water Works Co.	12.6%	11.9%	11.4%	11.7%	10.6%	10.0%	9.6%	5.1%	6.6%	7.2%	8.6%	8.0%	8.9%	9.5%	9.1%	8.0%	10.5%	8.2%	10.5%	10.5%	10.5%
Aqua America, Inc.	9.7%	8.9%	9.7%	9.4%	7.9%	8.2%	10.0%	9.7%	10.8%	11.8%	11.5%	14.0%	13.4%	12.0%	13.1%	12.6%	12.7%	11.1%	12.2%	13.0%	12.5%
California Water Service Group	10.1%	8.1%	9.3%	8.7%	9.2%	8.9%	8.9%	7.1%	8.9%	7.5%	7.9%	8.8%	9.4%	9.8%	10.6%	10.1%	13.0%	9.1%	8.7%	11.0%	11.5%
Middlesex Water Co.	9.4%	10.4%	9.1%	10.8%	10.3%	8.2%	8.0%	5.9%	6.1%	7.9%	8.2%	7.3%	15.1%	10.1%	13.0%	13.2%	9.9%	9.5%	9.1%	12.5%	17.5%
SJW Group	10.4%	11.8%	11.3%	11.8%	10.9%	9.7%	9.4%	9.8%	10.1%	9.7%	9.5%	9.5%	11.0%	11.6%	10.6%	11.1%	10.4%	10.8%	10.3%	10.5%	13.5%
York Water Co.																					
<b>Mean</b>	10.3%	9.5%	9.7%	10.2%	9.5%	9.1%	8.4%	8.0%	8.9%	9.0%	9.7%	9.9%	10.7%	10.4%	10.9%	11.2%	10.9%	9.6%	9.9%	11.9%	13.2%
<b>Median</b>	10.0%	9.7%	9.5%	10.1%	9.8%	9.2%	8.9%	8.7%	8.9%	8.1%	9.3%	8.8%	10.2%	10.1%	10.6%	11.1%	10.5%	9.6%	9.6%	12.5%	13.0%

Source: Calculations made from data contained in Value Line Investment Survey.

PROXY COMPANIES  
MARKET-TO-BOOK RATIOS

Company	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2002-08 Average	2009-18 Average
<b>Value Line Water Group</b>																			
American States Water Co.	181%	181%	164%	192%	229%	233%	194%	184%	179%	160%	183%	235%	253%	307%	321%	356%	404%	196%	258%
Aqua America, Inc.	289%	295%	291%	383%	376%	319%	74%	81%	97%	122%	144%	159%	180%	197%	251%	274%	282%	196%	179%
California Water Service Group	182%	200%	213%	233%	232%	217%	226%	231%	237%	245%	253%	295%	283%	291%	316%	322%	325%	311%	280%
Connecticut Water Service, Inc.	275%	266%	233%	216%	208%	204%	200%	206%	178%	170%	164%	175%	182%	172%	218%	279%	287%	210%	203%
Middlesex Water Co.	233%	247%	246%	249%	208%	190%	159%	145%	186%	197%	171%	165%	186%	188%	234%	256%	242%	229%	200%
SJW Group	199%	189%	218%	264%	287%	279%	205%	176%	182%	171%	171%	178%	178%	197%	266%	288%	323%	219%	205%
York Water Co.	282%	287%	287%	311%	340%	288%	188%	212%	218%	232%	233%	252%	267%	279%	366%	394%	330%	234%	201%
																		283%	278%
<b>Mean</b>	234%	238%	236%	264%	269%	247%	180%	176%	179%	182%	185%	204%	213%	226%	274%	304%	311%	240%	226%
<b>Median</b>	233%	247%	233%	249%	232%	233%	195%	180%	181%	171%	171%	177%	184%	197%	259%	284%	310%	232%	211%
<b>Parcell Proxy Group</b>																			
American States Water Co.	181%	181%	164%	192%	229%	233%	194%	184%	179%	160%	183%	235%	253%	307%	321%	356%	404%	196%	258%
Aqua America, Inc.	182%	200%	213%	233%	232%	217%	74%	81%	97%	122%	144%	159%	180%	197%	251%	274%	282%	196%	179%
California Water Service Group	233%	247%	246%	249%	208%	190%	159%	145%	186%	197%	164%	175%	182%	172%	218%	279%	287%	210%	203%
Middlesex Water Co.	282%	287%	287%	311%	340%	288%	188%	212%	218%	232%	233%	252%	267%	279%	366%	394%	330%	219%	205%
York Water Co.																		283%	278%
<b>Mean</b>	220%	229%	228%	246%	252%	232%	162%	166%	166%	169%	177%	199%	212%	230%	284%	318%	325%	227%	225%
<b>Median</b>	208%	224%	230%	241%	231%	225%	188%	184%	178%	160%	164%	176%	182%	197%	266%	288%	323%	221%	212%
<b>Walker Water Group</b>																			
American States Water Co.	181%	181%	164%	192%	229%	233%	194%	184%	179%	160%	183%	235%	253%	307%	321%	356%	404%	196%	258%
Aqua America, Inc.	289%	295%	291%	383%	376%	319%	74%	81%	97%	122%	144%	159%	180%	197%	251%	274%	282%	196%	179%
California Water Service Group	182%	200%	213%	233%	232%	217%	196%	206%	178%	170%	164%	175%	182%	172%	218%	279%	287%	210%	203%
Middlesex Water Co.	233%	247%	246%	249%	208%	190%	159%	145%	186%	197%	164%	175%	182%	172%	218%	279%	287%	210%	203%
SJW Group	199%	189%	218%	264%	287%	279%	205%	176%	182%	171%	171%	178%	178%	197%	266%	288%	323%	219%	205%
York Water Co.	282%	287%	287%	311%	340%	288%	188%	212%	218%	232%	233%	252%	267%	279%	366%	394%	330%	234%	201%
																		283%	278%
<b>Mean</b>	228%	233%	237%	272%	279%	254%	177%	176%	178%	180%	187%	210%	217%	231%	279%	311%	321%	242%	229%
<b>Median</b>	216%	224%	232%	257%	260%	256%	194%	184%	179%	170%	171%	178%	182%	197%	266%	288%	323%	234%	214%

Source: Calculations made from data contained in Value Line Investment Survey.

**STANDARD AND POOR'S 500 COMPOSITE  
RATES OF RETURN ON AVERAGE COMMON EQUITY  
AND MARKET TO BOOK RATIOS**

<b>Year</b>	<b>Return on Average Equity</b>	<b>Market-To- Book Ratio</b>
<b>2002</b>	8.4%	295%
<b>2003</b>	14.2%	278%
<b>2004</b>	15.0%	291%
<b>2005</b>	16.1%	278%
<b>2006</b>	17.0%	277%
<b>2007</b>	12.8%	284%
<b>2008</b>	3.0%	224%
<b>2009</b>	10.6%	187%
<b>2010</b>	14.2%	208%
<b>2011</b>	14.6%	207%
<b>2012</b>	13.5%	214%
<b>2013</b>	14.5%	237%
<b>2014</b>	14.2%	268%
<b>2015</b>	12.1%	273%
<b>2016</b>	12.7%	271%
<b>2017</b>	13.9%	310%
<b>Averages:</b>		
<b>2002-2008</b>	<b>12.4%</b>	<b>275%</b>
<b>2009-2017</b>	<b>13.4%</b>	<b>242%</b>

Source: Standard & Poor's.

## PROXY COMPANIES RISK INDICATORS

Company	Value Line Safety Rank	Value Line Beta	Value Line Financial Strength	
<b>Value Line Water Group</b>				
American States Water Co.	2	0.70	A	4.00
American Water Works Co.	3	0.55	B+	3.33
Aqua America, Inc.	2	0.70	A	4.00
California Water Service Group	3	0.70	B++	3.67
Connecticut Water Service, Inc.	3	0.60	B+	3.33
Middlesex Water Co.	2	0.75	B++	3.67
SJW Group	3	0.60	B+	3.33
York Water Co.	3	0.75	B+	3.33
<b>Mean</b>	<b>2.6</b>	<b>0.67</b>	<b>B+/B++</b>	<b>3.58</b>
<b>Parcell Proxy Group</b>				
American States Water Co.	2	0.70	A	4.00
American Water Works Co.	3	0.55	B+	3.33
California Water Service Group	3	0.70	B++	3.33
Middlesex Water Co.	2	0.75	B++	3.67
York Water Co.	3	0.75	B+	3.58
<b>Mean</b>	<b>2.6</b>	<b>0.69</b>	<b>B+/B++</b>	<b>3.58</b>
<b>Walker Water Group</b>				
American States Water Co.	2	0.70	A	4.00
American Water Works Co.	3	0.55	B+	3.33
Aqua America, Inc.	2	0.70	A	4.00
California Water Service Group	3	0.70	B++	3.67
Middlesex Water Co.	2	0.75	B++	3.67
SJW Group	3	0.60	B+	3.33
York Water Co.	3	0.75	B+	3.33
<b>Mean</b>	<b>2.6</b>	<b>0.68</b>	<b>B++</b>	<b>3.62</b>

Sources: Value Line Investment Survey, Standard & Poor's Stock Guide.

## PROXY COMPANIES AND STANDARD & POOR'S 500 RISK INDICATORS

Group	Value Line Safety Rank	Value Line Beta	Value Line Financial Strength
S&P 500	2.4	1.04	B++
Value Line Water Group	2.6	0.67	B+/B++
Parcell Proxy Group	2.6	0.69	B+/B++
Walker Water Group	2.6	0.68	B++

Sources: Value Line Investment Survey, Standard & Poor's Stock Guide.

### Definitions:

Safety rankings are in a range of 1 to 5, with 1 representing the highest safety or lowest risk.

Beta reflects the variability of a particular stock, relative to the market as a whole. A stock with a beta of 1.0 moves in concert with the market; a stock with a beta below 1.0 is less variable than the market; and a stock with a beta above 1.0 is more variable than the market.

Financial strengths range from C to A++, with the latter representing the highest level.

Common stock rankings range from D to A+, with the latter representing the highest level.

## WATER UTILITIES RISK MEASURES COMPARED TO SIZE

Company	Market Capitalization (\$000)	Value Line Beta	Value Line Safety	S&P Bond Rating
<b>Value Line Water Utility Group</b>				
York Water Co.	\$425,000	0.75	3	A-
Connecticut Water Service, Inc.	\$800,000	0.60	3	A
Middlesex Water Co.	\$875,000	0.75	2	A
SJW Group	\$1,100,000	0.60	3	A
California Water Service Group	\$2,300,000	0.70	3	A+
American States Water Co.	\$2,500,000	0.70	2	A+
Aqua America, Inc.	\$6,100,000	0.70	2	A+
American Water Works Co.	\$16,400,000	0.55	3	A

Sources: Value Line, S&P, Moody's.



ELECTRIC UTILITY COMPANIES RANKED BY SIZE  
RISK INDICATORS

COMPANY	2018 CAP (\$000)	VALUE LINE			S&P STOCK RANKING	S&P BOND RATING	MOODY'S BOND RATING
	Value Line	SAFETY	BETA	FIN STR	S&P		
Under \$5 billion							
MGE Energy Inc.	2,300,000	1	0.65	A	A-	AA-	A1
El Paso Electric Co.	2,400,000	2	0.70	B++	B	BBB	Baa1
NorthWestern	3,000,000	2	0.60	B++	A+	BBB	Baa2
PNM Resources	3,100,000	3	0.65	B+	B	BBB+	Baa3
Black Hills Corp.	3,300,000	2	0.80	A	B	BBB+	Baa2
Avista Corp.	3,400,000	2	0.65	A	A-	BBB	Baa1
ALLETE	3,900,000	2	0.70	A	A-	BBB+	A3
Hawaiian Electric Industries, Inc.	3,900,000	2	0.60	A	A-	BBB-	
Portland General	4,100,000	2	0.60	B++	A-	BBB+	A3
IDACORP	4,900,000	2	0.60	A	A	BBB	Baa1
Average		2.0	0.66	B++/A	B+/A-	BBB+	Baa1
\$5 billion - \$15 billion							
SCANA Corp.	5,700,000	3	0.65	B	A	BBB-	Ba1
Vectren	5,900,000	2	0.65	A	B+	A-	A2
OGE Energy Corp.	7,300,000	2	0.90	A	A-	BBB+	Baa1
Pinnacle West Capital Corp.	9,400,000	1	0.60	A+	A-	A-	A3
Alliant Energy	10,000,000	2	0.65	A	B+	A-	Baa1
CenterPoint Energy, Inc.	12,000,000	3	0.85	B+	B	A-	Baa1
CMS Energy Corp.	14,000,000	2	0.55	B++	A-	BBB+	Baa1
Entergy Corp.	15,000,000	3	0.60	B++	B	BBB+	Baa2
Average		2.3	0.68	B++	B+/A-	BBB+/A-	Baa1
\$15 Billion - \$25 Billion							
Ameren Corp.	16,000,000	2	0.60	A	B	BBB+	Baa1
Avangrid	16,000,000	2	0.30	B++	NR	BBB+	Baa1
Eversource Energy	16,000,000	2		B++	B	A-	Baa3
FirstEnergy Corp.	18,000,000	2	0.60	B++	B	BBB	Baa3
Fortis	18,000,000	2	0.65	B++	A-	A-	Baa3
Eversource Energy	19,000,000	1	0.60	A	A	A+	Baa1
DTE Energy Company	20,000,000	2	0.60	B++	A-	BBB+	Baa1
PPL Corp	20,000,000	2	0.70	B++	B	A-	Baa2
WEC Energy Group	22,000,000	1	0.55	A+	A	A-	Baa1
Edison International	23,000,000	2	0.65	B++	B	BBB+	Baa1
Consolidated Edison, Inc.	24,000,000	1	0.45	A+	B+	A-	A3
PG&E Corp.	25,000,000	3	0.65	B	B	BBB+	Baa2
Xcel Energy Inc.	25,000,000	1	0.55	A+	A-	A-	A3
Average		1.8	0.58	B++/A	B+	BBB+/A-	Baa2/Baa1
Over \$25 Billion							
Public Service Enterprise Group, Inc	26,000,000	1	0.65	A++	B+	BBB+	Baa1
Sempra Energy	32,000,000	2	0.75	A	B+	BBB+	Baa1
American Electric Power Company	36,000,000	1	0.60	A+	B+	A-	Baa1
Exelon Corp.	41,000,000	3	0.65	B++	B	BBB	Baa2
Dominion Energy	46,000,000	2	0.60	B++	B	BBB+	Baa2
Southern Company	50,000,000	2	0.50	A	A-	A-	Baa2
Duke Energy Corp.	58,000,000	2	0.57	A	B	A-	Baa1
NextEra Energy, Inc.	80,000,000	1	0.60	A+	A	A-	Baa1
Average		1.8	0.61	A	B+	BBB+/A-	Baa1

Sources:

Value Line Investment Survey  
East -- August 17, 2018  
Central -- September 14, 2018  
West -- October 26, 2018

S&P Stock Guide, March 2018

Moody's website, as of late October 2018

Standard & Poor's website, as of late October 2018